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# China Report

ECONOMIC AFFAIRS

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18 JUNE 1986

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## ECONOMIC DEVELOPMENT ZONES

### GOVERNOR REVIEWS FUJIAN DEVELOPMENT STRATEGY

Fuzhou FUJIAN RIBAO in Chinese 17 Nov 85 p 1

[Article by Weng Xinhui [5040 2450 6540]: "Fujian Must Find Its Own Way to Development"]

[Text] "The public impression of Fujian depends to a large extent on its impression of Fuzhou. Therefore, Fuzhou must fulfill its role as a 'pacesetter,' conscientiously sum up experience and be its own trailblazer in the open door policy and development. It must emphasize economic results, attain a high standard, stabilize its market, earn more foreign exchange and send more products into the international marketplace. It must function as a 'window,' a 'link' and a 'shining example.'" So said Governor Hu Ping [5170 1627] as he concluded a 2 1/2-day inspection of urban economic work in Fuzhou.

From the afternoon of 13th this month through 15th, Governor Hu Ping led a group of leading cadres from the provincial government and relevant departments and bureaus to Fuzhou to review our work. They successively visited Fuxin Kinescope Factory, Ronggang Aluminum Co, Ltd, Fuzhou No 1 Plastics Plant, the municipal cold storage plant, the Fuzhou Economic and Technical development Zone and the Shuangfeng Gold Fish Farm and Taijiang agricultural market in Taijiang Village in the outskirts. Wherever he went, Governor Hu Ping invariably immersed himself in the production areas and learned every detail about the production and operations of the concern he was visiting, particularly the amount of foreign exchange required, output value increases and the foreign exchange balance. He was briefed by Mayor Hong Yongshi [3163 3057 0013] and other relevant departments and became acquainted with some of the difficulties and problems facing Fuzhou in its work at the moment. He also discussed the solutions with the officials present.

Governor Hu Ping expressed satisfaction with Fuzhou's recent achievements in reform and the open door policy, particularly the modernization of old enterprises, the introduction of advanced technology and equipment, the Fuzhou Economic Development Zone and urban construction and administration. He said, "My overall impression of the municipality is this: it has had some achievements and acquired some experience. It is full of drive and although it has problems, it also has hope." Then he asked of Fuzhou a number of things in its economic work in the next 2 years. First, Fuzhou must fully recognize its heavy historical responsibility. As the provincial capital, a

hub city, a port city, and an opened city, Fuzhou should become the province's domestic and international window and function as a link and be a shining example. It should also be a new scientific and technical development center. Second, Fuzhou must hack out a path for itself in implementing the open door policy and development, instead of following in others' footsteps. It should exploit its own strong points and minimize its weaknesses, such being the only way to be competitive. Moreover it must pay attention to product renewal and succession, import new technology and develop new products. Third, in its economic work in the next 2 years, Fuzhou should focus on four aspects: emphasize economic results, improve standard, earn more foreign exchange and stabilize the market. As an opened city, Fuzhou should take pains to earn foreign exchange. It can go in for processing with imported materials, compensatory trade, labor export and so on. Fourth, it must unleash the initiative of all sectors of the population and mobilize the entire city's workers, peasants, scientific and technical personnel and overseas Chinese to come up with ideas to accelerate the municipality's development. Fifth, it must strengthen urban construction and administration and, depending on its actual conditions, adopt modern managerial techniques to run the city.

Governor Hu Ping also hoped that the various relevant departments in the provincial government would actively support Fuzhou's development by providing information, technology, projects and funds. He was accompanied by Vice Governors Wang Yishi [3769 0001 1102], Chen Mingyi [7115 2494 5030] and Chen Binfan [7115 1755 5672] on his inspection tour.

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## ECONOMIC DEVELOPMENT ZONES

### IMPROVING AIR SERVICE, TELECOMMUNICATIONS IN ECONOMIC ZONES

Beijing RENMIN RIBAO OVERSEAS EDITION in Chinese 16 Dec 85 p 3

[Text] Officials from the Civil Aviation General Administration disclosed a few days ago that airport construction will be completed and air routes established at all special economic zones [SEZ's] and opened coastal cities in the early part of the "Seventh 5-Year Plan" period.

Of the 14 opened coastal cities and 4 SEZ's, 15 cities have air links with other places. Airport construction or expansion is under way in Beihai, Wenzhou and Nantong. These facilities will be put into service in the next couple of years.

In the year or more since China further opened 14 coastal cities, Yantai, Ningbo, Qinhuangdao and Lianyungang have successively become accessible by air. The Civil Aviation General Administration has set up over 20 air routes flying into opened cities, increased scheduled flights between Shanghai and Japan and the U.S., and added three international air routes linking Beijing with Australia, Singapore and Kuwait, all via Guangzhou. There are now scheduled or charter flights between the six cities of Guangzhou, Shanghai, Xiamen, Tianjin, Fuzhou and Haikou, and Hong Kong.

Government investments and local funds have made possible the construction or expansion of more than 10 airports in opened coastal cities. After expansion, airports in Dalian, Qingdao, Haikou and Zhanjiang can now accommodate the landing and take-off of wide-body jets. Xiamen used foreign capital to build its international airport and founded the Xiamen Aviation Company which now offers services between Xiamen and nine domestic and foreign cities.

It has been learned from the Ministry of Posts and Telecommunications that China is stepping up the construction of telecommunications facilities in SEZ's and opened coastal cities. Estimates are that those facilities will be able to provide foreign investors will telex services next year. By 1987, international long-distance automatic dialing will be available in most cities.

An official from the Ministry of Posts and Telecommunications said that program-controlled telephone switchboards imported from abroad have been put

into service in Shenzhen, Guangzhou, Fuzhou, Xiamen and Tianjin to handle municipal and long-distance calls. Similar switchboards are expected to be operational in most other coastal cities next year.

The official said that the following projects, now under construction, are scheduled for completion and operation next year: the 1,800 channel microwave between Nanning and Beihai; the 960 channel microwave between Xuzhou and Lianyungang; and the digital microwave circuit between Haikou and Sanya (on Hainan Island), which has a transmission speed of  $2 \times 34$  megahertz. The 960 channel, small concentric-lay cable between Pingdu and Yantai is also under intensive construction.

Two international communications exchanges are being built in Beijing and Shanghai and will go into operation at the end of next year or early 1987, upon which international long-distance automatic dialling services will become available in cities with program-controlled switchboards.

Officials from the ministry said that the government has also installed much-needed semi-automatic international long-distance telephone facilities in SEZ's and opened coastal cities, most of which are expected to be delivered to users by the end of the year.

Minister of Posts and Telecommunications Yang Taifang [2799 3141 5364] has said earlier, "Automatic dialing for international long-distance calls will gradually become a reality in provincial capitals, economic centers and opened coastal cities in the next 5 years."

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## ECONOMIC DEVELOPMENT ZONES

### BRIEFS

FOREIGN CAPITAL IN QINGDAO--Qingdao is accelerating the pace of utilizing foreign capital. In only a bit more than one year's time it has signed 47 contracts to utilize foreign funds at a direct investment of more than \$115 million. Some 15 of the projects are joint or cooperative ventures using more than \$106 million. Characteristics of Qingdao's foreign fund usage follow:

1. Foreign investment is mainly directed toward industry. Some 60 percent of the 15 joint and cooperative venture projects for which contracts have already been signed are of a productive nature. Rather large projects include the Hualin Plywood Co Ltd, a joint venture between the Qingdao Furniture Co and Finland, with a total investment of \$18.88 million and the Qingdao No. 2 Brewery, a joint venture between the Qingdao Beverage Co and Hong Kong and Macao, with a total investment of \$58 million.
2. The goods are mainly sold abroad. All quartz and electronic watches produced by the joint venture between the Qingdao Watch Works and Hong Kong are sold abroad. Dry white wine produced by the Huadong Grape Rice-Wine Co Ltd and plywood made by the Hualin Plywood Co Ltd is exported, 90 percent and 72 percent, respectively. All other projects are also able to achieve a foreign exchange balance.
3. The emphasis is on the development of technology-intensive light, textile and electronics industries. Joint and cooperative ventures in these industries account for 82 percent of the total amount invested. [Text] [Jinan DAZHONG RIBAO in Chinese 7 Nov 85 p 2] 12615

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## FINANCE AND BANKING

### REFORMS IN BANKING SYSTEM OUTLINED

Beijing RENMIN RIBAO OVERSEAS EDITION in Chinese 17 Nov 85 p 1

[Article by Zhang Yushu [1728 3768 2579] and Liu Xiao [0491 7197]: "Ten Point Reform of China's Finance and Banking System Carried Out. Beginning Made in Comprehensive Use of the Role of Economic Levers. Continuing Efforts Required to Eradicate Existing Shortcomings"]

[Text] Chinese People's Bank Deputy Director Liu Hongru [0491 7703 0320] noted recently in a conference of managers of Chinese banks and insurance companies abroad that after several years of reform, China's banking and finance system has made a preliminary start at getting rid of its image as purely a "paying and receiving agent" for savings and loans and has taken major strides along the road toward a "bank that really does banking and makes use of the role of economic levers."

Deputy Director Liu said that China's finance and banking system had carried out reforms mostly in 10 regards since 1979 as follows:

A start in change of mentality of "stressing loans and slighting savings," focusing attention to the use of economic methods to expand savings and amass funds. Concurrent with the expansion of self-determination in enterprises and a rise in the people's earnings level since 1979 has been a rise in bank interests rates on savings accounts, an increase in the number of savings accounts, the establishing of more outlets at the grassroots level, and a tremendous increase in bank deposits. During the six year period 1979 through 1984, the annual increase in deposits averaged 38.1 billion yuan for an annual 20.2 percent growth.

Expansion of the scope of loans and broadening of eligibility for loans. A change has been made from the issuing of loans only for use as circulating funds to issuance of loans for fixed assets; from the issuance of loans principally to state-owned enterprises to issuance of loans for economic diversification and to individuals; and from the issuance of loans only in the production and goods circulation areas to issuance of loans to all trades and industries. Now the bank may make a loan so long as it is socially necessary, is in keeping with policy provisions and can be repaid.



Reform of the loan control system, demolishing some of the red tape surrounding the "supply system," and a beginning to apply loan and interest economic levers to promote a rise in economic effectiveness.

Preliminary reform of the undiversified modes of bank credit, trying out flexible and varied credit forms. For example, commercial credit, credit to sellers, discounting of bills, consumer credit and trust business have played a positive role in enlivening the economy. Some places have issued checks and business debentures as means of amassing more funds.

Reform of the foreign exchange control system and the foreign exchange credit system, expanding monetary dealings with foreign countries. Reform of foreign exchange controls, institution of a withholding system, and flexible readjustment of foreign exchange prices have promoted foreign trade. In addition, the most has been made of the role of banks as windows for raising money from outside China and for operating various kinds of foreign exchange savings and loans businesses.

Reform of the banking system and establishment of a central banking system with separate specialty banks, founding of many other kinds of financial institutions, and preliminary formation of a cooperative financial system with the central bank at the center, in which specialty banks play a major role and in which other financial institutions share labor.

Reform of the credit funds control system. Banks instituted a control system consisting of a centralized internal planning, level by level management, linking together of savings and loans, and responsibility for shortfalls. Unified planning among all banks, dividing up of funds, loans based on deposits and a mutual accommodation management system were instituted, which rather effectively aroused the enthusiasm of government and banks at all levels for comprehensive control of credit funds.

Revival of the insurance business within the country, and establishment of an insurance economic compensation system. With expansion of the commodity economy, we rapidly revived and developed the internal insurance business that had been halted for 20 years, and the number of kinds of insurance have increased to 120. In addition, foreign insurance has also rapidly expanded, the kinds of insurance increasing to more than 30.

Preliminary change in the nationwide unified receipts and disbursements financial control system and bolstering of economic accounting.

Preliminary establishment of a bank economic information network and buttressing of economic research and theoretical research to provide large amounts of valuable forecasting for economic reform and to increase the effectiveness of the macro-economy.

Deputy Director Liu Hongru believes that though the reforms carried out so far have been only preliminary and partial, and that even though various shortcomings existing in the country's financial and banking system have not been fundamentally eradicated; nevertheless, the thrust of reform is toward the target and its effect is immense. They should be continued and steadily expanded and improved.

## FINANCE AND BANKING

### BANK OF CHINA IN SHANGHAI KEY SOURCE OF JOINT VENTURE LOANS

Beijing RENMIN RIBAO OVERSEAS EDITION in Chinese 3 Nov 85 p 3

[Article by Chen Maodi [7115 3029 1717]: "Shanghai Branch of Bank of China Expands Business. Further Expansion of Scope of Loan Business. Supports Needs For Chinese and Foreign Joint Venture Capital"]

[Text] Business has steadily increased during the past 2 years at the Shanghai branch of the Bank of China and achievements have been scored.

The deputy director of this bank branch which specializes in foreign exchange, Zhou Mengxiong [0719 1125 3574], recently spoke of several achievements to reporters that demonstrated progress in expansion of the branches' business.

He said that the Shanghai branch bank had made loans to more than 70 percent of the Chinese and foreign joint venture businesses in Shanghai. Chinese and foreign joint venture businesses in which it had invested included not only the Shanghai Dazhong Automobile Co. Ltd., but also in a Shanghai joint venture with Pilkington Co. of England for float glass, a joint venture with the Hong Kong Globe Toy Co. for zinc alloys, and a joint venture with the United States Consolidated Marine Petroleum Company.

The Shanghai branch bank now offers bank guarantees and notary public services, providing guarantees on loans for domestic and foreign customers. When a German bank provided the container factory of the Shanghai Shipyard with a 22 million mark loan in what was Shanghai's largest compensation trade processing imported materials--importing a conveyor production line and materials from the Federal Republic of Germany for the production of containers--the Shanghai branch of the Bank of China provided the final reimbursement guarantee, bringing the project to a settlement.

Zhou Mengxiong also indicated that the bank will continue expanding its range of services, including the following:

--Further expansion of the scope of loan services to support loan requirements of Chinese-foreign joint venture enterprises, including providing various operating capital and fixed asset loans;

- Active participation in syndicated loans with foreign banks;
- The providing of loan and credit services to foreign investors; and
- Development of its "pivotal" and go-between roles in attracting foreign capital.

Deputy director Zhou Mengxiong said that Shanghai will continue to encourage attracting of foreign investment and welcome even more foreigners to come and set up factories. The Shanghai branch of the Bank of China will provide better services in aspects such as loans and accounts settling, and is also willing to participate in cooperative ventures with foreign businesses.

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## FINANCE AND BANKING

### BANK OF CHINA OVERSEAS BRANCH DIRECTORS MEET IN BEIJING

Beijing RENMIN RIBAO OVERSEAS EDITION in Chinese 3 Nov 85 p 3

[Article by Liu Xiao [0491 7197] and Zhang Yushu [1728 3768 2579]: "Bank of China Pioneers Business Abroad. Very Great Increase in Both Savings and Loans During Past 6 Years. Directors of All Overseas Branches Study and Discuss Plans in Beijing"]

[Text] The work of both the Bank of China and other Chinese banks abroad has expanded appreciably. Between 1978 and 1984, business volume increased 4.4 fold. The information was obtained by this correspondent from the meeting of directors of overseas branches of the Bank of China, which opened in Beijing on 1 November.

A briefing placed the number of Bank of China branches abroad at 293, and the number of employees at more than 9,500. The scope of operations has expanded steadily and business is in process of developing in the direction of becoming more diversified and internationalized. Business vitality has become stronger and the level of management has risen. As of the end of 1984, the total value of assets in branches abroad amounted to \$18.3 billion, up 2.9 fold from 1978. Savings deposits amounted to \$9.6 billion, an almost twofold increase from 1978, and loans amounted to \$4.7 billion, a more than threefold increase from 1978. In addition, the financing capacity of branches abroad has markedly improved and both influence and confidence have increased. Chinese banks in the Hong Kong and Macao area have preliminarily formed into a bloc that has become an increasingly important element in the stability and prosperity of Hong Kong and Macao.

Branches abroad have made considerable strides in supporting China's four modernizations. In 1984 alone, banks in the Hong Kong and Macao area directly or indirectly used more than 500 loans totaling more than HK\$4 billion for construction or trade in China, and they worked jointly with other units concerned in Hong Kong in the holding of urban investment meetings open to the public for the promotion of Chinese and foreign economic cooperation. London, New York and Singapore branches have supported the building of some major projects in China through export loans and banking group loans. All branches are urging customers to invest in China and they have done much work in providing them information, credit surveys and consulting services.

The main topic for discussion at the meeting of the directors of Bank of China overseas branches was how these branches could better serve the building of China's economy during the period of the Seventh 5-year Plan. The conference will draw up a work plan for the Seventh 5-year Plan period based on a summarization of work done at the conference, and the meeting will close on 23 November.

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## INDUSTRY

### TECHNOLOGICAL PROGRESS, DEVELOPMENT OF STEEL INDUSTRY

Shenyang DONGBEI GONGXUEYUAN XUEBAO [JOURNAL OF NORTH EAST INSTITUTE OF TECHNOLOGY] in Chinese No 4, Dec 85 pp 107-114

[Article by Shao Xianghua [6730 6272 5478]: "Iron and Steel Industry Develops Rapidly Amidst Technological Progress"]

[Text] Iron and Steel Industry--"Sunset Industry" Or "Sunrise Industry?"

China has a long history of metallurgy but its modern iron and steel industry began to develop only after the founding of New China. Its steel output in 1983 was 40,020,000 tons, which ranked fourth in the world. This is a great achievement that deserves cheers.

During the past 35 years the development of China's iron and steel industry went through several major phases of ups and downs. During the periods of recovery and the First Five-Year Plan between 1949 and 1957, the growth of steel output was normal and exponential. From 1958 to 1960, high quotas were pursued and output doubled but it created serious imbalance in the national economy, and during the "hard times" that followed output essentially dropped to the initial level prior to the Great Leap Forward. From 1962 to 1966, the industry returned to normal growth but with the start of the 10 years of turmoil steel output fell sharply once more. Subsequently it went up and down repeatedly, finally fluctuating around 23,000,000 tons for 6 or 7 years. Relatively stable growth resumed after the cultural revolution, and by 1983 output exceeded 40,000,000 tons. We can very roughly assume that without those two major disruptions and if the iron and steel industry had been able to expand in a normal way, then even if the growth rate was slower than that of the period 1952-1957, an annual output of 40,000,000 tons could have been reached even before 1970. It should be pointed out that such growth is possible. Among the three countries whose current steel output is higher than China's, Japan had indeed achieved relatively stable high rate of growth from the time after the Second World War to the 1973 oil crisis, attaining an output of 119,000,000 tons in 1973. The growth of the Soviet Union's postwar steel output was even more stable and sustained, with an output of 151,000,000 tons in 1978. U.S. steel output exceeded 100,000,000 tons as early as the mid-1950's. Subsequent fluctuations were great, but it also set a record of 137,000,000 tons in 1973.



After the early 1970's the development of iron and steel in the major steel-producing countries underwent fundamental changes. The steel output of the U.S. and Japan underwent great fluctuations and the overall trend was a sharp decline, of which the U.S. output fell to half of that in 1973. The circumstances with Western European countries were similar. Soviet steel output did not fluctuate much but even so it ceased to grow after 1978. At the same time, the growth of the iron and steel industry in some Third World countries and regions was noticeable, particularly the Chinese mainland (see above), the Chinese province of Taiwan (which grew from 470,000 tons in 1971 to 50,300,000 tons in 1983). South Korea (which grew from 550,000 tons in 1971 to 11,920,000 tons in 1983), and Brazil (which increased from 6,000,000 tons in 1971 to 14,650,000 tons in 1983).

The serious recession in the U.S. iron and steel industry during the last 10 years or so occurred at the same time as the recession in its other traditional manufacturing industries such as automobiles and heavy machinery. Be because it leads the whole world with the rapid development of its "high-tech" economy represented by electronic computers, during this period the U.S. economy did not collapse because of its sagging basic manufacturing industries but its GNP continues to rank first in the world.

Such an intensive change in the U.S. economic structure would certainly cause active reactions from the circles of thinkers. Through the news media and some "best sellers" in the past decade, a number of thinkers and futurists represented by Baier, Toffler, and Nesbitt successively put forth new views on social development which captured the attention of many people and transmitted abroad. In their view, mankind began to move from a primitive towards an agricultural society 10,000 years ago and began to move towards an industrial society 200 to 300 years ago. But now it has reached a new stage and is advancing in an ever-increasing pace toward a "post-industrial society," "super-industrial society," "high-tech society," "information society" or "the third wave of civilization" (different terms are used by different authors). It is evident from their writings that this new society they speak of generally refers to one characterized by computers, information transmission and processing, new sources of energy, new types of materials, marine development, biological techniques and robotics. Reportedly, the majority of people in this society no longer engage in the production of goods but provide services, and so-called services are in fact primarily the creation, processing and distribution of information. Some of them use the term "sunset industry" to describe the capital-intensive traditional manufacturing industry including the so-called "smoke stack industry," and maintain that they are rapidly being eliminated. They also blame their government which has adopted certain policies aimed at increasing production for being "short-sighted," "prolonging the life of dying companies" and "hindering the growth of 'sunrise industry'."

Industrially advanced countries, particularly the trend of growth and opinion in the U.S. described above, greatly differ from China which is concentrating its strength on the four modernizations and therefore this deserves our attention. Lately, some of their books have been published in China, some video tapes have been shown and a great deal of interest has been aroused. Their viewpoints described above have exerted considerable influence on some

people. In order to clarify this issue, I have recently looked into and studied the writings of those futurists and special American publications and checked with well-known figures in science and technology who have visited China and found the following points worth noting.

1. What those futurists describe are circumstances in the American society. Although they speak of the course of development in the U.S. as the fore trend of the entire world, at least they have not clearly stated that countries which have developed industrially late should also abandon industrialization in favor of information now. On the contrary, some authors have stressed global mutual economic coordination and argued that the world should become one in which "countries depend on each other." Clearly, what they mean is that basic manufacturing industries should be left to the Third World while the Americans themselves engage in a "high-tech" economy.

2. The viewpoint that sets up an antithesis between "high technology" and industrialization or basic manufacturing industries does not have general support in the American society. I have asked several well-known American professors who visited China this year and they replied that they had not heard of any argument for the imminent elimination of "sunrise industry," "sunset industry" and basic manufacturing industries in the U.S. A council member of the Chinese Academy of Sciences who has recently returned from a visit to the U.S. also said that he posed the same question with the same concern to many authoritative figures in scientific and technological circles in the U.S. and most people gave the same response. Clearly, the argument for industrialization giving its place to information has not aroused much interest even in the U.S. itself or at least American scientific and technological circles.

3. It is true that some people in the American industrial circles and scientific and technological circles have published their opinion on the viewpoints described above, not in favor of them but against them. For instance, the "outstanding speech" on materials and society in 1983 (written by Smith) of "Metallurgical Transactions," one of the most important publications in metallurgical studies in the U.S., used a great deal of facts to illustrate that the main causes of the great difficulty encountered by the American mining and metallurgical industry in recent years are not the frequently cited reasons of depletion of resources, environmental pollution and international competition. Rather, they are of social causes, confusion caused by some people who take advantage of the "freedom of speech" and forget their own responsibility toward the society and carry some of their own deductions to the extremes. In the same way, as pointed out by Timken Company's chairman of the board in his articles, if Americans indeed agree that they must abandon manufacturing industries and act on it, it will create disastrous consequences for the American economy since weakening basic industries will inevitably weaken overall economic strength. The current president of the American Society for Metals pointed out in a recent report that the output value of basic industries in the early 1970's made up 48 percent of the total manufacturing output value but it was 51 percent in 1981 (output value of "high-tech" industry in the same year was 22 percent), so evidently basic industries are still the cornerstone of the U.S. economy. He also stressed the close connection



between basic and high-tech industries, the necessity of common growth, and the indispensability of both. It would appear that in the U.S. itself, people in scientific and technological circles and industrial circles differ greatly in their views from the futurists mentioned above. What they stress is the need to strengthen basic manufacturing industries, fully adopt modern technology in basic manufacturing industries and fully utilize "high technology" to rescue heavy industry.

4. The structural reform in the change from an industrialized society to a "post-industrial society" does not conform to U.S. national policy. It should be pointed out that national policy is frequently contradictory and inconsistent in a country such as the U.S. Pressured by public opinion, different parts of the U.S. have indeed carried out many policies that are unfavorable to the growth of traditional industries such as excessively strict environmental protection regulations, excessively high wage scales and the disadvantageous tax system. But as a representative of general policies, the U.S. Congress passed the National Materials Policy Act in 1970 and stressed the need to maintain a strong mining and metallurgical industry for the national economy and national security. In 1980 it again passed the National Materials and Minerals Policy Act which was similar in substance. "Basic research on iron and steel" was one of the 15 key areas of engineering technology in the next decade as put forward by the U.S. National Science Board earlier this year.

I think it is clear from the above that the argument of industrialization being outdated, which has continually appeared in American society in the last decade, is only born in the minds of some thinkers in reaction to the prolonged depression in the industries. It is transmitted through large-scale public opinion media and popular literature and is spread more widely than serious writings so that it has created considerable influence over the general public and has indeed created unfavorable conditions for industrial growth. I believe that if we treat such a one-sided view as a matured theory and allow it to have extensive influence in China, our determination and confidence in our efforts in the four modernization drive will be hindered.

China's steel output currently ranks fourth in the world but its import of steel products is also among the highest. When China's gross industrial and agricultural output value quadruples by the year 2000, even more steel products will inevitably rely on imports. This condition is very abnormal and we must narrow the gap as much as possible. Our party and government are leading iron and steel circles in the country in an effort to accomplish this. If countries which are developed in iron and steel indeed abandon or weaken their iron and steel production according to the arguments of those futurists, then it will be even more urgent for us to develop our own iron and steel industry at high speed. In this sense, their "major trend" is a challenge for us.

In order to narrow the critical gap in China's steel products in the future, we must never rely on what certain prophets say, replacing them with "more advanced" materials. The use of other materials (such as aluminum, plastics, composite materials, and ceramic materials) to replace iron and steel for certain purposes has already been realized and undoubtedly this will have to be expanded in the future. But evidently, due to limitations of technology

and economic considerations, the quantity and variety of possible substitutes can constitute only a very small portion for a long time to come. Therefore, our only choice is to assimilate, develop and create even more advanced iron and steel techniques, technology, equipment, and processes through science and technology and other areas in order to build a new foundation for the future. Therefore, in my opinion, the iron and steel industry is not a "sunset industry" in the U.S. and less so in China; it is a "sunrise industry" that has developed along with the growth of New China which still needs to be actively expended in the future and which will distinguish itself and flourish in the four modernizations.

If we do not regard "high technology" as an uncompromising competitor of traditional industries but as a partner that helps each other forward, the reform and growth of traditional industries will be enormously aided by traditional industries. In the iron and steel industry, computer-aided management, operating control, and design have already produced important economic results, and it is highly likely that they will be more fully utilized and developed. The use of the laser as a method of metallic finishing and a basis for test technology has already been realized and its future is bright. The use of biological techniques to develop new methods in prospecting, ore dressing, and fighting environmental pollution has yielded results. Marine development has provided the metallurgical industry with new resources. New low-cost energy will remove a serious limitation to the growth of iron and steel. It is evident from these examples alone that in the short run or the long run, the development of "high technology" will provide numerous opportunities to the growth of the iron and steel industry. Metallurgical scientists and technicians should not let these opportunities pass by but should make use of and develop them. Conversely, the growth of "high technology" itself requires a great deal of metallic materials with new functions, many of which must be undertaken by the iron and steel industry. This is a challenge as well as an opportunity.

#### Some Views on New Technology in Iron and Steel Production

Prolonged depression in the iron and steel industry abroad has made international competition even more intense. This has resulted in a great deal of technological transformation and even new technology and processes so that the face of iron and steel works continually changes, laying the foundation for future growth. One may say that progress in the iron and steel industry is also in the ascendant worldwide. From our vantage point, those people who maintain that it is rapidly declining are far out of touch with reality.

Extensive work has begun in many areas of China's iron and steel production technology, some of which have already yielded tangible economic results. I will discuss ideas and suggestions on several major areas of development for use as reference.

##### 1. Converter composite blowing

Compared to top-blown converters, bottom-blown converters which came out in the 1960's have good molten bath mixing so that they have brought advantages

including a high rate of return, economization of deoxidants, ease in smelting low-carbon steel and increased capacity. In a matter of several years they have built a production capability of 30 to 40 million tons in several countries.

However, bottom-blown converters came out after many large modern enterprises were established in various countries, and along with the depression after 1973 they quickly ceased to expand and some of the ones constructed have even stopped or cut down production. The depression set off competition for survival among enterprises which all sought to increase efficiency. People quickly discovered that results essentially similar to those of bottom-blown converters can be produced by merely blowing in a small quantity of gas at the bottom of top-blown converters. Once this so-called "composite blowing" came into existence it spread quickly throughout the world. Today, the absolute majority of top-blown converters in Japan and major steel producing countries in Western Europe has been transformed into composite blowing. Bottom-blown converters which have been constructed have also been installed with top oxygen blowing, resulting in a new form of composite blowing. Small wonder someone has predicted that no longer will anyone build converters that are purely top- or bottom-blown.

Like other new technology, there is a great variety of composite blowing. The founder of each method makes up his own name, and as a result a large number of names for composite blowing, totalling more than 20, has appeared from top-blown to bottom-blown converters.

These methods primarily differ in: (1) the quantity of bottom-blown gas, the type of gas used (argon, nitrogen, air, carbon dioxide, or oxygen), and the method of blowing (double-layer casing, circular seam pipes, seamed bricks, porous plugs); (2) the quantity and form of top oxygen supply; (3) whether solid materials are sprayed at the same time (flux or fuel). Many steelworks in China have adopted composite blowing for their original top-blown converters and have obtained good economic results. The Wuhan Iron and Steel Works uses argon. The Ma'anshan Iron and Steel Works, which is experienced in bottom-blown converters uses oxygen. Most of the other steelworks currently use nitrogen. The Capital Iron and Steel Works has tested the use of nitrogen in the former phase and switched to carbon dioxide in the latter phase. The gas intake components used by the various steelworks include all the varieties except porous plugs.

It is natural that each steelworks uses the most economical and effective method of composite blowing under its own circumstances. There is no need to demand uniformity. Some overall views on composite blowing are discussed below:

(1) The key to metallurgical results and economic benefits in composite blowing described above is mixing. The strength and weakness of the function of mixing is determined primarily by the quantity of airflow, and secondarily by factors such as the type of gas used and the way it is blown into the molten bath. But blowing nitrogen tends to increase the amount of nitrogen in the molten bath when blowing oxidizing gases plays a strong role in the corrosion of refractory materials particularly in the latter phase of smelting.

Argon is the most ideal mixing gas but it is too expensive. A rational way is to blow other gases in the former phase (determined by the specific conditions), and switch to argon in the latter phase. Argon should be recovered in the steelworks' own oxygen station and supplied for converter mixing and other uses.

(2) Compared to those in Japan, the U.S., and many in Europe, the sulphur content of molten iron is relatively high in quite a few steelworks in China. Intensifying the effect of mixing on molten bath dephosphorization is a complex problem. People frequently say that composite blowing is beneficial to dephosphorization, meaning that the phosphorus content of slag at the end of the latter phase of converter blowing is lower than the balance value, and that intensifying mixing can enable even more phosphorus to enter the end slag and lower the amount of end phosphorus. On the other hand, it is precisely a state of deviation from balance that can impel any reaction to take place; slag concentration (ferrous oxide) exceeding the value of molten steel balance can speed up dephosphorization. Therefore, if the molten iron is high in phosphorus, intensifying mixing may in fact lower the productive capability of converters. For steelworks which use raw materials high in phosphorus, the best mixing system needs to be determined through tests in order to assure the required degree of dephosphorization and at the same time without being too high in the end slag (ferrous oxide).

## 2. New technology of higher scrap steel consumption by converters

The growth of converters and decline of open-hearth furnaces have caused a surplus of scrap steel in the world. This makes higher consumption of scrap steel by converters an issue with strong economic significance. Compared to top-blown converters, the scrap steel consumption capability of bottom-blown converters and composite-blowing converters is much lower. Many bottom-blown converters abroad can amend this shortcoming by blowing oxygen on the top so that the carbon monoxide in the converter gas is burned into carbon dioxide.

This is also one type of composite blowing. For the same purpose, many composite converters refitted from top-blown converters also have the structure of their top-blown oxygen guns transformed to supply oxygen for secondary combustion (double-flow oxygen gun) apart from the main oxygen flow. Based on the experience abroad, this can enable the scrap steel ratio to regain its original level in top-blown converters or even surpass it. But the quantity of carbon monoxide generated in converters is limited by the composition of molten iron while secondary combustion reaction cannot fully take place under high temperature conditions inside converters. Consequently the ability to increase the scrap steel ratio by this method alone is limited, which is under 100 kilograms per ton of steel.

One way to drastically increase the scrap steel ratio is adding more fuel to converters. Over a decade ago some steelworks abroad added coal or crushed coke into ordinary top-blown converters and were indeed able to somewhat increase the quantity of scrap steel, but terminal control was difficult and there were dangers of increased nitrogen in molten baths and hindrance to dephosphorization. Subsequently, two steelworks in Britain and Holland cooperated in using double-flow oxygen gun on a 100-ton composite-blown



converter and adding anthracite through the mouth at the same time, but the increase of scrap steel did not exceed 30 kilograms per ton.

West Germany has recently developed several methods to increase the scrap steel ratio by simultaneously blowing in gum and powdered coke at the bottom of bottom-blown converters. The KMS method, which has been in production for many years and which consumes 55 kilograms of coal per ton and 90 cubic meters of oxygen per hour, can reach a scrap steel ratio of 50 percent. Moreover, two 125-ton converters have been built using the KS method with the aim of using 100 percent scrap steel (and sponge iron) as raw materials, which competed with the super-high power electric furnace. Further more, there is the COIN method which is being tested and which differs from the KS method primarily in the construction of their bottom-blown components.

China has a smaller supply of scrap steel than Europe and the U.S. and there is no demand for converters to use 100 percent scrap steel as raw materials. But increasing the scrap steel ratio is still an issue of great economic significance and it become even more prominent for converter plants which use semi-steel as raw materials. Besides, quite a few converters in China currently use molten iron from cupola furnaces as raw materials and each year they consume millions of tons of high-grade coke, which is not economical. We believe that by learning from the experience of West Germany and by studying and developing our own composite blowing methods of blowing coal and oxygen, we can tackle the problem of certain plants in drastically increasing the scrap steel ratio and provide a method to curtail and even avoid cupola smelting.

The purpose of the COIN method of West Germany is not limited to the consumption of scrap steel by converters. Further research is being undertaken to use waste gas of coal-spraying converters as the reducing reagent of iron ore and the iron after reduction as the raw materials for coal-spraying converters. In this way, the growth of composite converters is intertwined and combined with reduction by melting, forming a new iron and steel production process which is discussed in the next section.

### 3. Direct reduction and reduction by melting

Integrating the new (pangang) process, China has done a great deal of research on direct reduction. Extensive research on reduction by melting has been undertaken abroad in recent years. Quite a few units in China are also planning to develop this work on a new basis.

These methods have several major features as compared to traditional iron melting by the blast furnace: (1) non-reliance on coking coal resources; (2) economical production can be achieved on a relatively small scale; (3) low investment cost and fast construction of plants.

Sponge iron produced by direct reduction can substitute part or even all of the scrap steel as raw materials for steelmaking by electric furnaces. Direct reduction--electric furnace used as a blast furnace--the process other than the converter, has once made progress abroad. But the most matured direct

reduction method in the industry, such as MIDREX and HYL, used natural gas as energy and therefore could not continue to develop particularly after the oil crisis. So far there is no economically tenable and reliable method for direct reduction based on solid fuel. Consequently, even though the prediction that direct reduction would replace the blast furnace has been going around for several decades, currently at least 98 percent of the steel output in the world is produced by the blast furnace.

The other method of iron-smelting not using the blast furnace is reduction by melting. Iron ore is melted and solid carbon is then added for reduction, and the conditions for heat and mass transfer are better than the gas-solid low temperature reaction of the direct reduction method and a very high speed in reduction can be reached. Moreover, coal (or powdered coke) can be used as solid carbon, eliminating the necessity of using metallurgical coal as well as natural gas. Perhaps this is why the growth of research on reduction by melting in the world during the past decade has been more active than direct reduction.

However, there are essentially two serious weaknesses with reduction purely by melting: (1) it is difficult to economically tackle the corrosion of refractory materials by melted ferric oxide; (2) restricted by thermal dynamic balance, under high temperatures (such as 1600°) the ratio of carbon dioxide/carbon monoxide in the gas phase which come into contact with iron-ferric oxide is very low, and consequently the unit consumption of carbon is high and not comparable to the blast furnace. Certain methods of reduction by melting such as ROTORED and CIP that are being studied and tested use centrifugal force to avoid the corrosion of furnace lining by ferric oxide but there is no solution to the high consumption of coal.

In order to overcome the two weaknesses mentioned above, many types of test processes for reduction by melting abroad have now added a pre-reduction process. First, partial reduction is carried out in low temperatures on ore (or pellets) in solid state, and then high-temperature melting and final reduction are carried out in another reactor. The heat source and reduction reagent of the former utilize the waste gas of the latter. Some of these processes are being tested while some have only been proposal, and there are more than 10 types. The end reduction of several types uses electricity as the heat source, and this is very similar to the sponge iron-electric furnace process mentioned above.

Reduction by melting is intended to get rid of the solid-state reduction of the direct reduction method previously developed (this process is called indirect reduction in blast furnace!), while the present trend is to combine the two, forming a two-step method which combines solid and liquid states. How similar is this course of development to that from top-blown converter to bottom-blown converter and to composite blowing! In fact, was not the familiar blast furnace at first a method to combine solid-state reduction and reduction by melting? After spending a great deal of efforts, a basic chemical process has taken a roundabout way and apparently returned to the original spot. But all this is to create even more economical technology and processes under specific resource conditions so that it is very worthwhile.

China is launching more serious research and testing of reduction by melting. In my opinion, in order to avoid detours and to assure that the growth of the iron and steel industry will truly play a role in the year 2000 and after, we must have clear goals, aim at specific conditions of regions or enterprises, formulate the most optimum programs, and conduct research and tests scientifically. The work outside China, particularly KR under Austrian-West German cooperation as well as COIN of KRUPP, are worthy of reference particularly for areas where ores and coal are available but are short of electric power.

#### 4. Pre-treatment of molten iron

The earliest pre-treatment of molten iron realized is the desulphurization of ladle soda ash. Later, primarily because provisions on sulphur content of steel became increasingly strict, many types of relatively particular pre-desulphurization techniques appeared when used carrier gas dusting, mechanical mixing and other principles. Desulphurizers also became diverse, extensively using calcium carbide, lime base mixtures and metallic magnesium. Today, the method of desulphurizing most of the molten iron to below 0.02 percent and part of it to below 0.005 percent has already been achieved in some iron and steel works.

The method of desiliconization of molten iron existed half a century ago and the purpose was to decrease the amount of slag during steelmaking and improve the capability to dephosphorize and desulphurize. Later, advances in blast furnace operations itself made it possible to lower the silicon content of molten iron and stabilize it (average approximately 0.7 percent in the U.S. and 0.3 percent in Japan; higher consumption of scrap steel by silicon in converters is advantageous), consequently pre-desiliconization techniques did not develop for a long period of time. But in recent years, particularly in Japan (low scrap steel operation), desiliconization of molten iron has again been placed on the daily agenda. It should be pointed out that the amount of silicon, sulphur and phosphorus in molten iron in Japan used to be quite low. Besides metallurgical benefits, there is one other major economic objective for the Japanese to desiliconize further, namely to totally use up the furnace slag of the iron and steel works without any accumulation. Concerning methods of desiliconization, Shin Nihon Seitetsu's tapping launder continuously blowing technique merits our attention.

Alkaline converters are basically very capable of dephosphorization, but the problem of pre-dephosphorization of molten iron was studied long ago. In 1965 someone in West Germany proved in the laboratory that soda ash combined with an oxidizer can simultaneously desulphurize and dephosphorize but it could not go into use because of economic and environmental reasons. A Shumitomo plant in Japan developed this method for industrial production by first desiliconizing a small quantity of the molten iron and then dephosphorizing it by blowing soda ash. The phosphorus content of the molten iron of that plant was not high to start with (0.1 percent) and the purpose of pre-treatment remained decreasing the amount of converter slag as much as possible. Kimitsu Steelworks' technique of using lime slag to dephosphorize has been put into production; KRUPP of West Germany has also industrially tested dephosphorization by spraying soda ash. The pre-dephosphorization method mentioned above cannot be

used for molten iron high in phosphorus. Some large steelworks in France do not rely on pre-treatment of molten iron. The process of smelting high-grade steel from high phosphorus iron will be discussed below.

In China, the phosphorus, sulphur and silicon content of molten iron vary greatly among different enterprises. Some of their molten iron contains vanadium, niobium and other paragenetic elements. The molten iron of only a minority of the enterprises is within the scope of regular "steel pig." Therefore, when we study and develop the pre-treatment of molten iron, we cannot merely consider pre-treatment itself but must thoroughly study the best (most economic) policy to eliminate (and utilize) these elements according to the specific conditions of specific locations, rationally distribute them among blast furnaces, molten iron pre-treatment, steelmaking, and the post-treatment of molten steel, and undertake corresponding technical research. Only in this way can we produce the most economically rational technology and process.

#### 5. Post-treatment of molten steel

The other way to lower the metallurgical load of steel-smelting furnaces in order to improve their production capability is post-treatment of molten steel. Molten steel post-treatment can achieve numerous different goals: de-airing, deoxidation, decarbonization, desulphurization, dephosphorization, fine adjustment of composition and temperature, elimination of impurities and changing the state of impurities.

The principal means of de-airing (hydrogen, nitrogen) treatment is vacuum and or blowing or argon. Vacuum treatment can also bring about the deoxidation of carbon or decarbonization of oxygen. Vacuum treatment and blowing of argon are the most extensively used techniques in the post-treatment of molten steel.

The next method is desulphurization. Using argon carrier gas and spraying desulphurizer (primarily silico-calcium alloys today) can lower the sulphur content to under 0.004 percent and can cause residue impurities to change into a less harmful state. Many units are studying the use of lime dust as substitute for silico-calcium alloys.

The degree of desulphurization of the West German MPF method is slightly poorer (below 0.008 percent) but it does not require special installations. Its key points are tapping without slag, blowing argon during tapping, adding small lumps of lime, fluorite and aluminum, and then blowing for several more minutes after covering. Tangible results have also been achieved in desulphurization at the Anshan Iron and Steel Works which uses a similar method.

In terms of the principles of chemistry, the oxygen level of molten iron is lower than that of molten steel, which is more advantageous for desulphurization so that pre-desulphurization of molten iron appears to be more rational than post-desulphurization of molten steel. But the scrap steel and slag material added in the course of steelmaking bring some of the sulphur so that for certain steel varieties even if the molten iron is highly desulphurized it cannot assure that sulphur content of steel will be up to standard and the



molten steel still needs to be desulphurized. In short, blast furnaces, pre-treatment, steel-smelting furnaces, post-treatment can all achieve different degrees of desulphurization. The principle of desulphurization and the specific methods to be used by the iron and steel works must be based on the conditions of raw materials, makeup of products, production capabilities and investment conditions, and are determined after careful accounting and scientific research. Conditions are similar for dephosphorization (see below) and the recovery and utilization of paragenetic elements.

Alkaline steel-smelting furnaces are basically highly capable of dephosphorization, but when used for the production of steel varieties with high phosphorus molten iron as the raw material and or for the production of varieties with very low phosphorus content, special technical measures must be used in order to ensure it. A good example is the many iron and steel works in northeastern France which use high phosphorus molten iron in raw material and which use large numbers of converters (including LBE, DBM, LMS)--ladle steel-smelting furnaces --continuous casting process. In order to give full play to the dephosphorizing capability of converters, they maintain the tapping temperature at the same level as mold casting. To prevent return of phosphorus (slag contains 15-20 percent of  $P_2O_5$ ), a bottom operation to pour ladles and separate slag is added after tapping. The molten steel temperature required by continuous casting is attained by relying on an arc temperature rising ladle steel-smelting furnace, and vacuum treatment can also be performed if necessary. Those plants do not rely on dephosphorization of molten iron and they mass produce all varieties of steel including those of super-low phosphorus content ( $\leq 50$  ppm). Reportedly, all ladle steel-smelting furnaces in France are built for this process. It is worth pointing out that in this process the safeguard of low phosphorus content by ladle steel-smelting furnaces is a necessary measure. These furnaces themselves do not dephosphorize but create conditions so that the converters can give full play to their dephosphorizing capability. As for steel varieties whose phosphorus content is particularly low, Sollac Steelworks adds some soda ash prior to the tapping of LWS, and tapping comes after half a minute, which helps dephosphorization.

For certain steel varieties particularly those that are high in elements easy to oxidize, it is feasible to conduct direct dephosphorization outside the furnace after the addition of calcium or calcium alloys to form  $Ca_3P_2$ .

It is evident from the above that research to develop new techniques and technology for iron and steel production are very active both inside and outside China. Moreover, the projects are diverse in substance and are inter-related and intertwined. This is because the economic and technological conditions among different countries, regions and enterprises have a general character but they also vary greatly and the methods of solving problems are also different. Each of our tasks must have clearly-defined goals and must be performed and directed at specific conditions and goals. We must use economic results as the criterion from start to finish and never one-sidedly pursue any particular technical target but must give consideration to economic results for the whole enterprise and the entire production process. This requires our workers in science and technology to have a comprehensive field of vision and be good at mutual cooperation. In this way we will be able to make significant contribution to the four modernizations of the motherland.

## FOREIGN TRADE AND INVESTMENT

### \$5.4 BILLION IN FOREIGN CAPITAL ABSORBED SINCE 1979

Beijing RENMIN RIBAO (OVERSEAS EDITION) in Chinese 26 Nov 85 p 1

[Article by Zhuang Nuo [8369 6179]: "China Has Absorbed \$5.4 Billion in Foreign Capital Since 1979"]

[Text] Shi Lin [4258 2651], adviser to the Ministry of Foreign Economic Relations and Trade, disclosed in Xiamen today that in the 6 years since 1979, China has effectively absorbed almost \$5.4 billion in foreign capital.

Shi Lin made the above disclosure to members of the Chinese and foreign economic communities at the opening ceremony of the Fujian investment promotion conference jointly sponsored by the Fujian provincial people's government and the Industrial Development Organization of the United Nations. He said, "In the last 6 years, China has made rapid progress in its drive to attract direct foreign investments. As of this September, China has signed a total of 7,030 contracts with foreign investors, with a combined value of \$14.7 billion in foreign capital."

It is understood that among these projects are 1,897 Chinese-foreign joint ventures, 3,408 cooperative enterprises, 109 wholly owned foreign enterprises, 31 cooperation projects in off-shore oil exploration and 1,585 compensatory trade projects.

Statistics from last January through September show further progress in China's effort to attract foreign capital. Altogether 2,197 contracts were signed, with the amount of foreign investments reaching \$4.1 billion, of which over \$1.1 billion have been invested.

Referring to the adoption of policies to encourage foreign investment and the formulation and perfection of laws and regulations to govern foreign economic relations and trade, Shi Lin said that so far China has promulgated over 50 specific pieces of legislation and signed investment protection agreements with 11 nations and concluded agreements with 5 nations aimed at avoiding double taxation. Other agreements are under negotiation.

FOREIGN TRADE AND INVESTMENT

CITIC INVOLVED IN 39 JOINT VENTURES, INCLUDING U.S. TIMBER

Beijing RENMIN RIBAO OVERSEAS EDITION in Chinese 16 Dec 85 p 3

[Article by Ji Hong [character illegible] [6060 3126 ]: "CITIC Expanding Its Operations"]

[Text] With 39 Chinese-foreign joint ventures and 3 umbrella-type joint ventures under its name, the latter set up as an experiment this year, the China International Trust and Investment Corp [CITIC] has taken another big step forward. This was disclosed at the corporation's sixth board meeting on the 14th.

The 39 Chinese-foreign joint ventures under the corporation can be found in such industries as metallurgy, coal, machinery, textile, food and light industry.

The three umbrella-type joint ventures launched by the corporation this year on a trial basis are also known as control-stock companies internationally. The CITIC is responsible for their overall investment planning and balancing foreign exchange income and expenses.

Last year the CITIC bought several tracts of timberland in the U.S. and Southeast Asia and set up joint ventures to take charge of felling and transportation. The timber from these tracts has successively been shipped to China.

The leasing system under the corporation -- the China Leasing Co, China Oriental Leasing Co and the leasing office of its banking section -- organized a total of about 700 projects in 1984-85 and is graduating from the position of a lessee to that of lessor.

To raise foreign capital, the corporation has been issuing bonds repeatedly in Japan, Hong Kong and the Federal Republic of Germany, and is expected to do so again in Japan soon. With the approval of the People's Bank of China, the banking section of the CITIC began accepting deposits in foreign currencies and the renminbi and offering export credit services on 14th.

Vice Premier Yao Yilin [1202 0181 2651] attended the board meeting and delivered the keynote speech,

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18 June 1986

## FOREIGN TRADE AND INVESTMENT

## RECORD CEREAL, OIL, FOODSTUFF EXPORTS EXPECTED IN 1985

Beijing RENMIN RIBAO (OVERSEAS EDITION) in Chinese 10 Dec 85 p 1

[Article by Feng Xiao [7458 7197]: "China's Cereal, Oil and Foodstuff Exports Expected To Be the Highest Ever"]

[Text] "China's cereal, oil and foodstuff exports this year are expected to exceed state targets and reach a historic high. Within approved limits, exports have been a profitable foreign exchange earner and produced good economic results." This was disclosed by Cao Wantong [2580 8001 6639], general manager of the China National Cereals, Oils and Foodstuffs Import and Export Corporation, during an interview with reporters yesterday.

Cao Wantong said that cereal, oil and foodstuff exports this year are expected to be 106 percent of the target, up 1.2 percent over last year, the highest level ever. If we include commodities such as aquacultural products, foodstuffs, beer and mineral water, the management of which has been delegated to local authorities, the actual exports will grow by 3.4 percent over last year. Export value will increase by 17.5 percent over 1984 while export losses are expected to be substantially smaller than predicted. Foreign exchange income for the state will grow by \$470 million.

Looking at the major export categories, most of the increase in exports occurred in the cereal and oil categories. Foodstuff export this year has dropped when compared to last year. Cereal and oil exports this year account for 47 percent of all foreign exchange income derived from exports, up 8.3 percent over a year earlier. Cereals exports increased 1.1-fold over last year's level to reach an all-time high. Estimates are that we will be able to export more cereals this year than we import. Edible oil, peanut oil, sesame seeds, live cattle, live poultry, frozen beef, fruit, canned pork, granulated sugar -- all have registered an increase in export volume this year.

Cao Wantong noted an obvious characteristic concerning the localities which have reached the target, namely, the marked increase in the amount of export handled by numerous localities. Of the dozen or so branch companies under the corporation, more than half managed to reach or exceed the annual target.

Cao Wantong said that the main reason why it has been able to do so well this year is that the entire corporation has consistently and firmly concentrated

on export and taken a variety of effective measures to pinpoint the sources of goods and promote sales aggressively. It has adhered to the united sales policy to cut losses, at the same time cultivating good customer relations, stabilizing the market and building up clients' confidence.

He also said that new efforts would be made in the coming year to develop new products and vigorously open up new markets. To expand export, we must also do a good job in processing with imported materials, turnover trade, compensation trade and third country trade. We should do everything we can to succeed in foreign trade.

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FOREIGN TRADE AND INVESTMENT

JAPAN, PRC TECHNICAL COOPERATION DISCUSSED

Tianjin KEXUEXUE YU KEXUE JISHU GUANLI [SCIENTIOLOGY AND MANAGEMENT OF S&T] in Chinese No 2, 1986 pp 4-6

[Article by Masaru Saito, professor, Chuo University, Japan: "On Technical Cooperation between Japan and China"]

[Text] I. Chinese Technological Strategy

At present, China is heavily engaged in the development of the focal point of its four modernizations. In its strategy to introduce foreign capital, China has strenuously studied the experience of other countries and adopted policies most favorable to China such as various policies about modernization, advanced industrial systems, and management and technology transfers which have nearly all been adopted. However, the focal points are still on the following aspects: 1) transplanting new industries; 2) strengthening management and technology transfers; and 3) doing its best to acquire better results for the four modernizations.

At present, China is trying, through various ways and means, to achieve technology transfers from foreign countries which concentrate not only on the "hardware" but on the "software" as well; they are not only introducing engineering technology but are also interested in the technology of management. They have corrected their shortcoming in the past of looking down on management and are striving to introduce enterprise management from the developed countries under the economic conditions of the free market.

From now on, the focal points of the Chinese technological strategy are: 1) to strive for the development and application of advanced technology in order to serve important areas of national construction. 2) To strengthen technological innovation and create a better structure for industry. 3) To strengthen the introduction, development, and computer technology. 4) To hasten the reform of economic and technology systems and their internationalization. 5) Considering the stage of technological development in China, technology transfers in addition to development based on self-reliance, are still crucial. The really necessary "four transfers" advocated by the Chinese government, which include science and technology transfers, must be carried out from foreign countries to China, from military to civil application, from coastal areas toward the inland, and from



laboratories to the site of production. However, there exist many problems in their realization. 6) In order to put the transferred technology into production, cultivation of talent is also one of the strategies adopted by China at present.

## II. Structure of Technology Transfer

In the past few years, the Chinese technology transfer market has been expanding rapidly and according to various patterns. In addition to trade, foreign investment, and technology cooperation, various routes of technology transfer have been opened. For example, the number of technology delegations and the people sent abroad for long- and short-term study increases year after year and this increase has occurred on a nongovernmental basis.

Now, there are graduate students in the big, medium-size, and small enterprises in Japan, and among the countries which have technological cooperation with Japan, China has the greatest participation.

China has introduced a great number of complete sets of equipment, such as complete sets of chemical engineering equipment in Shanghai, Zhejiang, and Tianjin; complete sets of thin-film manufacturing equipment in Gansu, Shanghai, and Tianjin; and complete sets of television set manufacturing equipment. In the technology trade in 1983, Japan has 41 percent of the total amount of the technology introduced into China, the United States has 30 percent, West Germany 9.5 percent, and Italy 6.5 percent.

The characteristics of the market of introducing technology into China are these: 1) speaking in terms of region, the large cities are the focal points and most of the technology introduced is concentrated in Shanghai, Tianjin, Beijing, and the Shenzhen Special Economic Zone; 2) in technology introduction, expenditures on "software" are mounting; and 3) the demand for high technology is increasing.

In addition, various kinds of high technology have been introduced through trade. It is said that the list of the Chinese delegations shopping for technical equipment abroad also includes: 1) satellite navigation systems; 2) tracking radar and laser range finders; 3) night vision equipment; 4) military vehicle simulators; 5) giant lathes for large-caliber cannons; and 7) though the introduction of technology for medium-size and small enterprises is vigorously advocated, the proportion of introduction into large enterprises and military technology has been greatest.

In addition to licensing, China has also introduced a large amount of technology through the purchase of machinery and complete sets of equipment. The major countries exporting technology in China in 1983 are Japan (25.9 percent, occupying first place), the United States (13.0 percent), Hong Kong (8.0 percent), Canada (7.5 percent), and East Germany (5.7 percent). From now on, Japan and the United States may become the center, and the introduction of technology from the developed Western countries will increase with the emphasis on introducing industrial technology from Japan and military and aircraft-related technology from the United States.

Japan occupies the first place in almost every aspect of technology transfer to China. In particular, Japan has accepted a great number of Chinese graduates majoring in various areas of technology. Even an analysis of the history of technology transfer to China up until now would produce the conclusion that China is in the climax of technology introduction.

Technology transfer from Japan has involved a wide range of technology in agriculture, and also other areas, such as industrial measuring-instrument technology, special natural gas valve manufacturing technology, electron microscope manufacturing technology, air compressor manufacturing technology, and industrial sewing machines. Medium-size and small enterprise technology introduction has also increased rapidly.

Looking at strategy, technology transfer requires the mutual efforts of technical personnel from both sides and that requires a better mutual understanding.

### III. Strategies of Technology Introduction

The strategy of technology introduction in China is first to make choices in technology based on the overall strategy and then to introduce certain technologies according to the plan. The characteristics of Chinese strategy in the introduction of technology related to people's livelihood are to attract technology to the country and to wait for the opportunity of international technology exhibitions to bring the practical technology into China after the acquisition of all the information, after which the discussions and transactions will proceed. The key to the discussions and the conclusion of transactions is completely determined by negotiations, and there is a substantial difference compared with practices in the developed capitalist countries.

In the procedure of technology introduction, China has first chosen urgently needed suitable technology and has carried out discussions with the companies related to that technology transfer. China also attracted tangible technology into the country through international technology exhibitions. In the discussion and the conclusion of transactions, the Chinese usually adopt a triangular negotiation pattern, which means to negotiate with both the company from which the technology is expected to be transferred and some other foreign company, that is, to open discussions among the foreign enterprises transferring that technology. The discussion item by item and category by category and the parts which can be locally manufactured are excluded from the discussion. People who attend the discussions are technical experts, experts in commercial affairs, financial experts, and legal experts, and through the coordination of these experts, they attack on many levels to increase their negotiating strength.

The experts on commercial affairs and the legal experts have carefully studied the "Charter of Activities on Technology Transfer" of the United Nations and



they are masters of the laws of industrial ownership. In the last few years, Chinese professional teaching materials on technology introduction have increased day by day.

According to the regulation of the policy published in 1979, articles which can be manufactured in the country will not be introduced regardless of price. In the introduction of complete sets of equipment, those which can be manufactured in China must be excluded; redundancy must be avoided; and the countries or enterprises will be chosen where parts, components, and raw and processed materials can be reasonably supplied. The stipulation mentioned above is a technology introduction policy based on technology transfer, and that technology transfer will in the long run be beneficial to the vigorous development of the country.

Technology introduction, in addition to patents, also includes the introduction of new mechanical equipment and foreign companies can proceed in the manner of investment. Therefore, these points can also be taken into consideration.

#### IV. Sino-Japanese Technological Cooperation

China, before the implementation of the open-door policy, received little economic and technological cooperation from the West. The acceptance of cooperation without compensation began in 1981. Cooperation with compensation for the sake of realizing the open-door policy cannot be expanded without considering the ability to pay. The value of technological cooperation reached its climax in 1981; since then the change has been small. In general in cooperation without compensation, a big project is the Sino-Japanese hospital (completed in 1984). In addition, the construction work on the Beijing Post and Telecommunications Training Center and on the Chinese Meat Foods Multiple-research Center is continuing. The focal points in cooperation with compensation are items of basic construction such as railroads, harbors and dams, and telephones.

In technological cooperation, the number of graduate students and professionals sent abroad and the number of engineering projects involving technological cooperation are increasing rapidly. Of the foreign countries helped by Japan, China has been number one since 1982; however, counting in terms of the average population helped by Japan, China is still last.

The developed countries entered the Chinese market through the centers of coastal cities such as Beijing, Tianjin, Shanghai, and Guangzhou. Manchuria is the place of principal resources and an area of heavy industry in the north, though the developed countries felt that the level of technological cooperation there was not enough.

China has been emphasizing agriculture. Therefore, it has achieved very good results in the development of agriculture. In industry, China as well as other socialist countries stressed the development of heavy industry. Thus the development of light industry and medium-size and small enterprises slowed. At present, China is striving for the development of medium-size and

small enterprises and their modernization to maintain the development of heavy industry, strengthen the flexibility and adaptability of the national economy, and stimulate the vitality of the enterprises.

#### V. Problems of Technological Cooperation

China is a socialist nation. Therefore, both the selection of the graduate students sent abroad and their work assignments can be done according to the plan. The medium-size and small enterprises in Japan accept a great number of graduate students each year but provide mainly on-the-job-training and are not professional training organizations. The students work very hard, yet the results of their study are low. Since there are more than 20,000 Chinese graduate students sent to our country each year, we had better adopt a more systematic method to do it. And this is consistent with the direction of "education cooperation" flourishing in Japan.

China is walking along the road of socialism, and maintaining independence, and keeping the initiative in its own hands, which contrasts sharply to the capitalist market of free competition. Though it uses the same techniques, the function and meaning are different. Nevertheless, even the technology from capitalist societies can contribute to the development of socialism. The developed countries in the West and East have blocked technology transfers to the Eastern countries in the name of "Coordinating Committee for Export to Communist Areas." This has been relaxed to a great extent to China in the past few years, yet it has not been abolished and may become strict again.

Chinese patent law was implemented in April 1985. To introduce advanced technology, patent rights must be acknowledged and the technology rightly protected. Proper implementation and observation of the law have a direct influence on the international prestige of a country. As for the suppliers of technology, if the technology is not protected under the law, they will no longer transfer their technology. Whether the Chinese are able to enforce the patent law correctly to provide sufficient protection to the rights of the technology suppliers is one of their great tasks. We can also say that the above understanding will apply the same to the foreign investment law, corporate law, and commercial trade law under formulation now.

In the following article, we will talk about the relation between the "four modernizations" advocated by the Chinese and Sino-Japanese technological cooperation. Military and national defense modernization is included in the four modernizations. For some reasons, Japanese technology cannot cooperate in every aspect of the four modernizations.

Finally, I think that all the developed countries, including Japan, seem to compete for cooperation in the technology transfers to China, yet it is not clear at present whether the introduction of technology into China is for the development of Chinese socialism, which is introverted, or for the joining international (export) competition, which is extroverted. Even if Chinese technology introduction is extroverted, it may not for the developed countries end up in eating one's own bitter fruit (Chinese version [Japanese to Chinese translator's note: that is, the possibility of China's becoming a developed

country and competitor), owing to the huge gap in the levels of technology between China and the developed countries, but to the NIC's in Asia and the countries of Southeast Asia, China is very likely to become a competitor. For industrial products of equal quality, especially the production of labor-intensive products, once export becomes possible, their impact on the large countries will be enormous. In case the coordination of shared production ([Japanese to Chinese] translator's note: that is, different countries produce different products) cannot proceed smoothly, it is very likely that trade conflicts will occur between China and the Asian NIC's and the countries in Southeast Asia. If the current Chinese open-door policy continues as it has, in the 1990's Chinese exports of industrial products will increase rapidly.

To solve the above problems and then maintain and accelerate the development in Asia to contribute to the peace of the world, it is necessary to establish, through Chinese economic development and her joining the shared production structure, a healthy interdependent relationship at least in Asia. And Japanese technology transfers must proceed in line with the contribution to that relationship.

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## FOREIGN TRADE AND INVESTMENT

### TRADE, ECONOMIC COOPERATION WITH EASTERN EUROPE EXPAND

Beijing RENMIN RIBAO (OVERSEAS EDITION) in Chinese 28 Dec 85 p 3

[Article by Feng Xiuju [7458 4423 5468]: "Overview of Trade with Eastern Europe"]

[Text] The year 1985 saw the fastest growth in economic and trade relations between China and countries in Eastern Europe in the 3 decades since such relations were established, with two-way trade reaching \$2.64 billion, according to Minister of Foreign Economic Relations and Trade, Zheng Tuobin [6774 2148 1755].

In an interview with reporters, Zheng Tuobin said that in 1985 China signed long-term trade agreements for the years 1986-1990 with Romania, Yugoslavia, Hungary, the German Democratic Republic [GDR], Poland and Albania. During his recent visit to Czechoslovakia and Bulgaria, Vice Premier Li Peng [2621 7720] also concluded long-term trade accords with the host countries.

As Zheng Tuobin sees it, the conclusion of those agreements signal the beginning of a new stage of long-term and stable development in Chinese-Eastern Europe trade and economic relations. It is estimated that bilateral trade under the new long-term trade agreements will increase significantly over that under the trade agreements for the last 5 years.

During the past few years, China's friendly and cooperative relations with Romania and Yugoslavia have been strengthened constantly. For many years, Romania has been our No 1 trading partner in Eastern Europe. Based on our trade agreement, bilateral trade was worth about \$760 million this year. During President Ceausescu's historic visit to China last October, the two sides reached a series of long-term economic accords, further brightening the prospects for bilateral trade and economic and technical cooperation.

Two-way trade between China and Yugoslavia has been expanding every year in recent times, rising to \$130 million in 1984, an increase of 65 percent over 1983, and registering a further gain in 1985 compared to a year earlier.

Our trade ties with Bulgaria, Czechoslovakia, the GDR, Hungary and Poland began in the early 1950's. In recent years our contacts have become more frequent, with a corresponding rise in the ranks of officials who visit one

another. We have also set up a number of ministerial-level economic, trade and technical cooperation commissions with them.

Discussing the development of economic relations and trade between China and Eastern Europe, Zheng Tuobin summed up their characteristics as follows:

1. A positive momentum has appeared in trade.

Statistically, Chinese-Polish agreements call for an increase of 180 percent in bilateral trade in 1985 over 1984. Corresponding figures for our trade with Hungary, the GDR and Czechoslovakia are 170 percent, 54.5 percent and 39.6 percent, respectively. Chinese-Hungarian trade has also gone up.

2. Changing export and import mixes.

As the economies of both sides mature and as industrial and technical standards improve, the composition of our exports and imports, along with that of Eastern European exports and imports, has been changing to various degrees. In the 1950's, for instance, Chinese imports from Hungary were dominated by complete sets of equipment and electrical machinery products, while our exports comprised mainly grain, edible oil, food and mineral products. After the 1970's, we increased our import of raw materials, semi-processed goods and market products from Hungary and reduced that of complete sets of equipment. Meanwhile, we exported to that nation more and more light industrial and textile goods and less and less mineral products, and began selling it machinery as well. Such changes in the import-export mix help satisfy each other's needs better and promote bilateral trade.

3. A good start has been made in economic and technical cooperation.

During the past year or so, apart from conducting regular trade, the two sides have actively been exploring and opening up new areas and methods of cooperation such as joint production, technical import, the technical modernization of old plants and cooperation in a third nation.

China and Poland have reached agreement this year to cooperate in a number of projects involving the technical modernization of the toffee, bread and cast stone production industries. We are discussing with Hungary cooperation projects in the manufacture of buses, light sockets and light bulk production lines. With the GDR, Czechoslovakia and Bulgaria, too, we have signed a number of contracts on technical modernization projects. Banks and corresponding units on both sides have stepped up direct contacts and business cooperation continuously.

Zheng Tuobin said that all this shows that provided both sides make a concerted effort, Chinese-Eastern European trade and economic cooperation is full of potential. He welcomed these nations, with their advanced technology and superior products, to cooperate with China. He also expressed the hope that the two sides will open up new fields of cooperation and develop new joint products. We must keep our prices fair, reasonable and competitive and adopt imaginative trade methods to develop cooperation in trade-industry integration and trade-technology integration. The aim is to promote one another's socialist enterprise.



## FOREIGN TRADE AND INVESTMENT

### BELGIAN LOANS FINANCE CHINESE PROJECTS

Beijing GUOJI SHANGBAO in Chinese 25 Nov 85 p 3

[Text] Each year since 1980, the Belgian government has provided us with 300 million Belgian francs (about \$5.5 million) in interest-free loans on very favorable terms: the loans will mature in 30 years, with a grace period of 10 years. In other words, principal repayments begin only in the 11th year.

Over the past 5 years, most of the 1.5 billion Belgian franc-credit has been used to finance the construction of the Yaomeng Electric Station (about 900 million Belgian francs) in Henan and the Bell Telephone project in Shanghai (about 600 Belgian francs).

In 1985 the Belgian government extended to the Chinese government a credit package totalling 1 billion Belgian francs. Of this amount, interest-free loans amount to 300 million Belgian francs and export credits account for the remaining 700 million. This credit package also carries very generous terms: 30 percent of a project must be paid for in interest-free loans and the remaining 70 percent in cash or export credit. Since the value of the 1985 loan package is higher than before, we may consider undertaking larger projects.

This batch of loans is now being processed smoothly with the concerted effort of the Ministry of Foreign Economic Relations and Trade and other relevant agencies. So far three contracts have been signed.

The Beijing Wuxing Brewery has signed a contract worth 225,574,600 Belgian francs with the You Min Bu La Company of Belgium, of which 27,672,380 Belgian francs will be paid for in interest-free loans.

The Shanghai Bell Telephone Equipment Manufacturing Company has signed two contracts with Belgium's Bell Telephone Manufacturing Company, worth a total of 663 million Belgian francs, of which 199 million can be paid for in interest-free loans.

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## FOREIGN TRADE AND INVESTMENT

### ECONOMIC RESULTS, EXPANDED TRADE REQUIRE ATTENTION

Beijing GUOJI MAOYI WENTI [INTERNATIONAL TRADE JOURNAL] in Chinese No 5, Sep-Oct 85 pp 23-27, 22

[Article by Ma Chuandong [7456 0278 2767]: "The Ecological Impact of Foreign Trade"]

[Excerpt] II

As the high-tech revolution gathers momentum and international trade expands, we must develop our foreign trade energetically so that it can further serve the open door policy and invigorate the domestic economy. But even as we go about promoting export trade, we must also sum up experience, adapt ourselves to changes in the international and domestic economic situations, and improve our import and export mix continuously in a way that enhances both ecological and economic results.

A. Since the liberation, particularly since the 3d Plenary Session of the 11th CPC Central Committee, China's foreign trade has scored spectacular achievements. But there remains much room for improvement from the perspective of ecological economics. (1) Our present export mix is an improvement upon what it was in the past, but like its counterparts in many developing nations, it remains heavily dependent on primary products (minerals, agricultural produce, sideline products and special native products.) Although the export of these products is essential if we are to earn foreign exchange to finance the import of advanced technology, equipment and materials, it still places us in the position of having to export extensively the nation's natural resources (especially petroleum and coal). At present mineral products; agricultural produce, sideline products and special native products; and industrial processed goods each account for about one third of the nation's total exports. In other words, two thirds of our exports today still consist of natural resources and related primary products. If this situation continues for long, it will have an adverse impact on the long-term coordinated development of China's ecology and economy. (2) In the course of developing and purchasing products for export, particularly when it purchased some agricultural and sideline products, the state in the past often ignored the unity of the ecological system and singled out certain products for which it paid exceptionally high prices, resulting in structural and functional imbalances in the ecosystem. For instance, the foreign trade

sector bought up a large quantity of yellow weasel skin and its by-products, thereby drastically reducing the population of the natural predator of mice. This is an important reason why we are overrun with mice these days. In coastal areas, the foreign trade sector paid such attractive prices for important exports like marten that peasants in coastal fishing counties and villages went in for marten-raising on a large scale and resorted to indiscriminate over-fishing, particularly of young fish. What resulted was not only a competition for fish between man and marten, but also serious damage to the fishery ecosystem in neighboring waters as the people scouted the seas for huge quantities of young fish to satisfy the marten's appetite. (3) There was a time when some of China's traditional agricultural and sideline products and arts and crafts were "flagship exports." But they have become uncompetitive in the world markets owing to declining quality, overly high pesticide contents, lack of variety of color and design, destruction of the agricultural ecological environment, preservation and processing problems, and so on. Chinese tea and fruits used to be very popular in the international market. Years of inattention to the breeding of better varieties and perhaps the destruction of forests have led to a deterioration in their ecosystems and an increase in pests. We had no choice but to fall back on pesticides, which caused tea leaves and fruits to decline in quality and hence in world competitiveness. Today our tea exports are no match for India's and our fruit exports are no match for those of the U.S., Japan and other nations. Such are the adverse effects of the destruction of the ecology on the development of foreign trade.

B. In our effort to improve China's export mix from the standpoint of ecological economic principles, we must pay special attention to the following two points:

1. In seeking to expand agricultural, forestry, fishery and animal husbandry exports and the sales of special native products, we must, on the one hand, consider the demands of the international market and gradually increase exports, and, on the other, take care to protect the quality of the ecosystem. We must take pains to combine organically the large-scale export of these products with the improvement of the quality of the ecological environment.

(1) Priority should be given to the development of agricultural, forestry, fishery and animal husbandry products which both earn handsome foreign exchange and benefit the ecology. Over the past 10 years or so, for instance, the inter-cropping of tung tree and grain in the Huang He and Huai He plains, including provinces like Henan and Shandong, is a good idea which has helped improve the ecology. The paulownia trees grown in the fields can be felled in 10 years and yield excellent timber for export. The Shangqiu area in Henan alone exported 15,000 cubic meters of paulownia timber in 1983. Similar achievements abound across the nation and should be promoted vigorously. What merits special attention is the cultivation of flowers for export, which beautifies the environment as well as being a major foreign exchange earner. All the celebrated flowers grown in China, such as the orchid, peony, Chinese rose, lotus, sweet-scented osmanthus and chrysanthemum, are steeped in history. The international flower market grosses over \$10 billion annually. As our flower export is exceedingly small, we should energetically tap our resources in this field and step up export.

(2) There are wildlife and wild plant whose over-exploitation above a certain level generates adverse effects on the ecological balance. The way to increase their export, therefore, must lie in the gradual development of a breeding industry. In southern China, for instance, the decline in the snake population has been largely responsible for the sharp increase in mice. And snake meat and snakeskin are much sought-after in the foreign market. To develop the export of snake meat and snakeskin, we must put an end to the wanton hunting and killing of snakes in the wild and slowly build up a snake breeding industry. With its ample snake resources, the Wuyishan nature preserve in Fujian Province has now established a snake farm to breed snakes, including more than half of the 62 species of wild snakes in the area. At its peak each year the snake farm has a total population of over 10,000. If all our southern provinces follow this example, our snake exports will go up and the snake population can be maintained at a level at which it can keep the rats under control.

(3) We must develop "flagship products" among our exports by making use of our special abundance in valuable agricultural, forestry, animal husbandry and fishery resources and special native products. We are naturally well endowed with the above resources, which are of a high quality and enjoy a strong international reputation. Their export once played an important role in the development of our foreign trade. The "Bohai shrimp" industry, for instance, contributed to the rising national exports. However, many of our priceless resources have also been imported and adopted by other nations and became their "flagship products." One example is the Chinese yangtao fruit which is now grown extensively by New Zealand and other nations for export. We are ecologically well suited to develop Yangtao cultivation and should make a concerted effort along this line.

(4) We should enhance the international competitiveness of a number of our traditional agricultural, forestry, fishery and animal husbandry products by improving their varieties and ecological conditions. Examples are tea and such major export fruits as apples, oranges, tangerines and grapes. At the same time the use of pesticides should be reduced.

2. In seeking to expand the export of industrial and handicraft products, we must work hard to sell more products to more nations in order to earn more foreign exchange to support the nation's economic development, on the one hand, and take care to preserve our mineral resources which are essential to our development but are of a limited quantity, on the other. Furthermore, in export development, we must be careful to reduce and prevent pollution.

(1) We must raise step by step the share of processed industrial products of the nation's overall export mix. Today we already have a considerable industrial processing and production capacity, with such coastal cities as Shanghai, Tianjin, Guangzhou, Qingdao and Dalian gradually emerging as formidable centers in many processing industries and becoming internationally competitive. We are now exporting a substantial quantity of light industrial and textile products, while electrical machinery goods and the shipbuilding industry, in particular, are doing better and better. This is a good beginning of our drive to improve the nation's export mix and gradually do

away with its reliance on minerals and agricultural products. John Naisbitt writes in "Megatrends," "For Third World countries, changing conditions will bring about increased competition with one another for a share of the manufacturing trade. That competition has heated up considerably with the recent emergence of China as a new contender in manufacturing. Until the late 1970's, China aimed to fund its ambitious modernization plans by selling raw materials, primarily oil. But China's leaders have changed their strategy. The Chinese will concentrate instead on light industries -- textiles, baskets, bicycles, radio and television assembly. Production in these industries soared 23 percent during the first half of 1980."<sup>1</sup> To make us more competitive in the international market, therefore, we must go all out to increase the export of industrial goods, including light industrial and textile products, food and electrical machinery. This is of great significance for improving the ecological economic results of foreign trade. Toward this end, we must strongly support those enterprises which satisfy the technical condition to produce competitive "flagship" products, and continuously develop a host of promising new products, including state-of-the-art products in the electronics industry.

(2) To expand foreign trade, it is undoubtedly necessary for us to export certain mineral products, particularly minerals of which we have vast reserves (e.g., coal), in an appropriate way. Nevertheless, we should also make an effort to develop processing industries using these resources, especially petroleum. We must gradually increase the export of refined petroleum products and correspondingly cut back on the export of crude oil. As for rare mineral resources, we must consider the future needs of our quickening industrialization and limit their export in the crude form while stepping up their processing for export.

(3) Even as we develop various machine processing industries, we should make use of the country's bountiful labor resources and our advantage as a major exporter of traditional handicrafts, and continue to develop the export of labor-intensive handicrafts, eg., Suzhou embroidery, Hunan embroidery, woolen embroidery, Sichuan embroidery, jacquard weaving, lace trimmings and all kinds of beautiful straw articles. Known as "smokeless industries," they basically do not cause any pollution and are more competitive internationally than their machine-made counterparts. The expansion of labor export also has great potential for a country like China with its massive labor resources.

C. We should improve our import mix under the guidance of ecological economic principles, paying particular attention to the following three aspects:

1. We must emphasize the import of advanced foreign technology, including equipment and know-how. This is essential to raising China's scientific and technological standard and ecological economic results. Generally speaking, advanced foreign technology and equipment are relatively fuel- and raw material-efficient and produce high-quality products. They also come equipped with complete anti-pollution devices. The appropriate import of such equipment, therefore, speeds up the technical modernization of enterprises and makes possible the rise of a number of technically advanced new enterprises (such as those making color TV sets, for instance). And since they turn out good products, they in effect increase the quantity of processed products we



sell overseas. So the import of advanced technology is bound to touch off a positive circle in which the level of our industry and technology goes up to the benefit of our ecology and economy. Certainly most of what we are buying from abroad right now consists of only intermediate technology in widespread use in other nations; foreign capitalists usually are not ready to sell us technology at the cutting edge, for which we must fall back on our own research efforts. We must be very careful when we import equipment for chemical industrial plants which may discharge highly toxic pollutants, and do our best to protect the environment. As far as possible such plants should not be built in medium-sized and large cities.

2. We should import as appropriate those products which help improve the quality of our environment. A few years ago China bought more than 10 million jin of grains each year, thereby cutting back on state food purchases in certain areas. This made it possible for the localities to fallow their land and let it regain its fertility. The acreage devoted to the cultivation of such cash crops as cotton, sugar crops and oil crops has also been suitably increased. As a result, the agricultural ecology has improved over the past few years and rapid progress has occurred in grain, cotton, oil and sugar production.

The low percentage of forest cover and timber shortages are presently an important part of the tension between the ecology and the economy in China. Hence we should import an appropriate amount of timber and paper pulp and, when the timber supply-demand gap begins to narrow, gradually reduce the number of trees we cut down in order to achieve a balance between annual cutting and annual growth. The import of timber is another sensible policy of promoting ecological economic results through import.

As for natural resources of which we do not have a good deal, eg., iron ore, we should again import appropriately in order to reduce the damage which mining and exploitation can do to the environment and speed up the development of our iron and steel industry.

3. We must aggressively develop industrial processing with imported raw materials and the export of processed goods. This is an important way of exploiting our abundant labor resources and our numerous opened coastal cities. In recent years, through such flexible trading methods as processing with foreign materials in accordance with foreign designs and assembling using foreign parts, we have earned a considerable amount of income. In the future, provided we take this kind of operations seriously, particularly in special economic zones like Shenzhen and the 14 opened coastal cities, we may hope to accelerate our foreign trade and the development of our processing industries, import more advanced equipment, gradually improve the import and export mix and upgrade ecological economic results.

#### FOOTNOTE

<sup>1</sup> "Megatrends," Chinese edition. Chinese Social Science Publishing House, p 61.

## FOREIGN TRADE AND INVESTMENT

### CHINESE-FOREIGN SHIPPING NETWORK EMERGING

Chengde JINGJI XIAOXI [Economic News] in Chinese 23 Nov 85 p 1

[Article by Shu [Unclear] [2579 xxxx]: "China Foreign Trade Shipping Network Emerges; Links Domestic and Foreign Ports Throughout the World"]

[Text] Li Chuntian [2621 2504 3944], general manager of the China Foreign Trade Transport Co and the China Boat Rental Co told this reporter that China's foreign trade reserve and transport capacity is rapidly developing. The Foreign Trade Transport Co presently has a fleet of approximately 1 million tons of oceangoing freighters and an equivalent amount of transport facilities that have established agency relationships with more than 300 ports or inland cities in 140 countries and regions. Thus an international transport network is emerging that is in contact with domestic and foreign ports throughout the world.

Li Chuntian said that the Foreign Trade Transport Co has two companies under it in the United States, the China Transport and China-America Transport Co. Representative offices are in Tokyo, Hamburg, Rotterdam, Antwerp, Hong Kong, New York and elsewhere. In the past 30 years the company has been continuously expanding business. In the early 1970's the first container ship line was begun. Thereafter container transfer stations were set up in 8 Chinese ports. Container transport has actively developed through Soviet Siberia, Europe and international rail lines. Since 1980 it has begun to develop various kinds of "door-to-door" international through transport. In recent years it started "desk-to-desk" express airmail services and cooperation with Korea to use the Korean port of Ch'ongjin as a transfer station. Manchurian export channels have been increased, reducing the pressure on the port of Dalian. A new direct river-ocean transport line to Hong Kong and Japan at the mouth of the Chang Jiang was set up, alleviating pressure on the port of Shanghai.

Based on the future needs of foreign trade development, the Foreign Trade Transport Co will actively create circumstances for increasing transport places in Latin America and Africa.

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## FOREIGN TRADE AND INVESTMENT

### ACHIEVEMENTS OF OPEN DOOR POLICY IN FUJIAN

Fuzhou FUJIAN RIBAO in Chinese 23 Nov 85 p 1

[Article by Yan Zhenyu 7346 2182 5148] and Li Fanglin [2621 5364 2651]:  
"Formerly a Closed Economy, Fujian Has Become an Open System"]

[Text] What have 6 years of the open door policy achieved for Fujian, one of the first provinces to adopt "special policies and flexible measures?" This is a question of much interest to people at home and abroad. Recently, in particular, localities have been launching a campaign to educate the public about current affairs and public policy and the open door policy is on everybody's lips. We all want to understand it better. It was with the above question in mind that we went to interview Vice Chairman Wei Lisheng [7614 5408 3932] of the Fujian Foreign Economic Relations and Trade Commission a few days ago.

#### A Multi-level, Multifarious And Multi-functional Open System Now In Place

"The open door policy has injected new vitality into our province's economic development. Right now Fujian is marching toward the world. From a closed economy, it is developing into an open one. The open door policy has achieved gratifying results." Wei Lisheng first told us his general impression of the open door situation in Fujian.

He said, "In 1979, our province began adopting special policies and flexible measures in external economic activities. In 1980, the State Council approved the establishment of the Xiamen Special Economic Zone [SEZ] and further approved the expansion of the limits of the Xiamen SEZ to the entire island in 1983. In 1984, it made Fuzhou one of the opened coastal port cities and authorized the establishment of an economic and technical development zone at Mawei. In early 1985, it approved the designation of 11 counties and municipalities in the Xiamen-Zhangzhou-Quanzhou triangle as a coastal economic development zone. The open door policy in Fujian now manifests itself in four ways: the Xiamen SEZ, the opened city of Fuzhou, the economic and technical development zone in Fuzhou and the economic development zone in the Xiamen-Zhangzhou-Quanzhou triangle in southern Fujian, forming a multi-level, multifarious and multi-functional coastal open economic system that stretches from Fuzhou to Dongshan. The open door policy is entering a new development stage. Six years' experience tells us that the policy has not only promoted

the province's foreign economic relations and trade, but also propelled the development of the entire national economy and society. Its effects are becoming more and more evident."

#### An Outstanding Record In Capital Construction

Wei Lisheng said, "By stepping up capital construction, we have considerably improved the investment climate in the province in recent years." We mentioned the strong impression we obtained when we came into contact with foreign businessmen in the course of covering stories and events. He said, "Yes, improvements in the infrastructure and investment climate are one outstanding achievement of Fujian's open door policy."

He said, "For historical reasons, Fujian languished in poverty, backwardness and isolation for years. Our energy, transportation and telecommunications sectors, in particular, were so underdeveloped that they limited developments in agricultural and industrial production. A few years ago, foreign investors in Fujian joked about being 'exiled' here. To change this situation in the shortest time possible, we have in recent years used foreign capital and local funds to improve such infrastructural facilities and services as energy, communications and telecommunications and continuously tried to perfect the investment climate and conditions. Over the past 6 years, we have essentially been involved in 10 major capital construction projects: building a brand new international airport at Xiamen; expanding the Fuzhou Airport, dredging Mawei harbor in Fuzhou, completing Phase 1 of the Dongdu harbor project in Xiamen, developing program-controlled telephone services in Fuzhou and Xiamen; modernizing the two railroads, the Yingxia line and the Waifu line, expanding the Yong'an thermal power plant, and putting up the Shaxikou hydropower station. Nowadays, there are wide-body passenger airliners linking Fuzhou and Xiamen with Beijing, Shanghai, Guangzhou, Hong Kong, Nagasaki and Manila. The construction of 10,000-ton deep-water berths in Fuzhou and Xiamen has been completed. The two program-controlled telephone networks in Fuzhou and Xiamen are the first modern telecommunications facilities to be put into service on the entire Chinese mainland, providing direct-dial access to major Chinese cities, Hong Kong, the U.S. and Japan. The construction of the Shaxikou hydropower station and Zhangping thermal power plant is proceeding round the clock, while the electrification of the two railroads, Yingxia and Waifu, is being stepped up. Tourist facilities, which have attracted friends from all continents, are being improved gradually too. No wonder many foreign friends say, 'It is easier to do business with Fujian now than before.' Others say, 'Visiting Fujian is now less of a hassle than in the past.'"

#### Fujian Has Absorbed Some Foreign And Overseas Chinese Capital

We asked, "Infrastructural projects have borne early fruits and improved the investment climate, creating the condition for attracting foreign and overseas Chinese capital. How then has the province been faring in this area?"

Wei Lisheng said, "Fujian has kept up a strong momentum in attracting foreign and overseas Chinese capital. The general trend is toward diversification. We are cooperating with more and more units, the channels of cooperation are broadening by the year and there has been a continuous increase in the number

of projects and their dollar value. From 1979 to October 1985, the province approved a total of 828 foreign contracts involving \$750 million in foreign capital, of which \$230 million has actually been invested. Late 1984 figures show that when converted into renminbi, foreign capital which has actually been spent was roughly equivalent to 9 percent of overall investments in the province during the same period. As of October 1985, 318 Chinese-foreign joint ventures have been set up, along with 322 Chinese-foreign cooperative enterprises and 12 wholly owned foreign enterprises." There are 108 projects to each of which foreign investors have committed at least \$1 million. Of these 108 projects, moreover, 19 involve foreign capital exceeding \$10 million each. Nations and regions investing in Fujian, formerly limited to Hong Kong, Macao, Japan and Southeast Asia, now number over a dozen, including the U.S., Australia, Kuwait, Jordan, Norway, Sweden, Italy, Spain and Britain. Many international financial organizations have established financial and credit relations with Fujian. The scope of investment has also been widened, from electronics, apparel and tourism to energy, transportation, precision instruments, chemicals and other technology-intensive industries. Most enterprises which have gone into operation have produced good economic results. Geographically, investment has spread from coastal cities and villages with a concentration of overseas Chinese to 18 counties and municipalities in the interior mountainous areas. The use of foreign capital has introduced us to a host of modern managerial experiences as well as advanced foreign technology. Direct foreign investment has broadened the province's tax base and created jobs."

#### Advanced Technology Has Been Imported And Old Enterprises Modernized

"The import of new technology goes hand in hand with the modernization of old enterprises. It occupies a strategic place in the vitalization of Fujian's economy. How is it coming along?" During our interview, we asked Wei Lisheng about the achievements in this field.

Wei Lisheng said, "The import of technology and equipment in recent years has boosted the technical modernization and progress in all the province's existing enterprises and industries. From 1979 through October 1985, the province imported more than 600 pieces of technology and equipment. They have been instrumental in substantially raising the standard of the production technology and the quality of the enterprises in such industries as electronics, light industry, textiles, foodstuffs, metal works, machinery, chemicals, pharmaceuticals, printing and packaging; promoting product succession and remedying whatever weaknesses existent in the industries. Among our imports, some are of the latest international standards of the late 1970's and early 1980's. The technologies of manufacturing contraction film, expandable pipe tobacco, high-frequency electric welding canning, medium-density fiberboard, enamel-insulated wire, low-quantity, high-intensity paper bag paper and color sensitive materials are all the first to be introduced to China and fill a technological void in the nation. Statistically, of the expansion in the province's total industrial output value last year, one third was attributed to improved economic results due to imports. The most outstanding industry is electronics. As of 1984, 51 production lines and assembly lines have been imported, the former to make spare parts and the latter to assemble whole sets of equipment, significantly enhancing the

industry's capacity for product renewal and succession. The electronics industry's total output value in 1984 reached 970 million yuan and made Fujian the nation's 6th largest electronics producer, up from the 16th position in 1980. A satisfactory momentum has also appeared in the import of foreign technology in agriculture, forestry, animal husbandry and fishery.

#### Expanding Foreign Trade And Intensifying International Transactions

Wei Lisheng then told us, "The open door policy has boosted our province's export capacity. The foreign trade situation is most gratifying. We now have trading partners in every continent."

He said, "Since the open door policy was adopted, we have made considerable progress in foreign trade, increased our foreign exchange earnings and improved our ability to make payments in foreign currency. In 1984, our imports and exports totalled \$692 million, up 2.4-fold over 1978. The average annual increase rate was 22.4 percent. With exports at \$420 million, up 7.4 percent over 1983, we sold more than we bought last year. As of 10 November this year, we have already fulfilled ahead of time all the export tasks assigned by the state, having exported \$350 million worth of goods. Our province now trades with over 120 nations and regions in the world. Our exports are diversified and come in all forms and shapes, with endless changes in pattern, color, design and variety. The export values of over 50 commodities are among the nation's highest, including 'Narcissus' canned food, 'Dove' plastic slippers and artistic cloth shoes, 'Sailboat' rosin, 'Litchi' and 'Rooster' mosquito-repellant incense. Products with a local flavor, such as jasmine tea, oolong tea, lotus seeds, white dried bamboo shoots, mushrooms and narcissus, and traditional arts and crafts like bodiless lacquer ware, Shoushan carved stone, lacquer furniture, straw goods and cork painting are all highly esteemed abroad. Then there is the range of new commodities which have already had a promising start. Examples are freshwater eel, sneakers, toys, jewelry, color , granite plate, electrical machinery and instruments, chemical products and such nonmetallic products as crystalline silicon and heavy spar, all with great potential.

"In recent years, we have made a good beginning in contracting for international projects and labor cooperation. How do we interpret the province's progress in this new area of international economic and technical cooperation?"

Wei Lisheng said, "Through a variety of channels and approaches, we have been contracting to build all kinds of projects and engaged in all forms of labor cooperation, in the process expanding international economic cooperation and exchange. From 1980 to the end of 1984, we concluded 177 contracts involving either engineering projects or labor cooperation, with a total price tag of over \$46 million. Altogether we have sent out 3,100 men times, most of them sailors, construction workers and personnel in such trades as apparel, toys and electronic assembly, to such nations and regions as Hong Kong, Macao, Japan, the Philippines, Singapore, Bangladesh, Yemen, Iraq, Sierra Leone, and . The projects we have undertaken include the Shuanglong Industrial Building and the Lingnan Industrial Building in Macao. Among our foreign aid projects are a sugar-cane plantation, a sugar refinery and staff



housing in Sierra Leone; the Hualimo Hydropower Station, the Beining Friendship Sports Stadium and other construction and installation works in Equatorial Guinea, and medical teams to Senegal and Botswana. In addition, 10 non-trade joint ventures and cooperative enterprises have been set up in Hong Kong, Macao, Bangladesh, Yemen, Thailand and so on."

"Our open door policy has another spectacular achievement, namely, expanding international economic interactions and developing friendly relations with other nations." Wei Lisheng briefed us about Fujian's foreign relations.

He said, "Right now Fujian has economic relations and trades with over 120 nations and regions in all five continents. To consolidate economic links and cooperation between Fujian and Hong Kong, Macao and the rest of the world, the province has established Huamin Co, Ltd in Hong Kong as the general agent for Fujian's enterprises in Hong Kong and Macao. Moreover, the province's Foreign Trade Corporation has set up external trade and economic cooperation offices and enterprises in New York, Tokyo, London, Togo, etc. In 1984 alone, the Fujian branch of the China Council for the Promotion of International Trade invited and received 170 relatively large-scale trade delegations from the U.S., Japan, the Netherlands, Belgium, Singapore and Hong Kong. It has also played host to 13 foreign exhibitions and their 800 participants from overseas and Hong Kong. In recent years, Fujian has established friendship relations with Nagasaki Prefecture in Japan, the state of Tasmania in Australia, and Oregon, U.S. Fuzhou has entered into friendship city relations with Nagasaki and Nara, both in Japan, while Xiamen has done likewise with Cardiff, Britain; Sasebo, Japan; Cebu, the Philippines; and Baltimore, U.S. Economic relations and trade between these friendship cities and prefectures have also been developing continuously, strengthening mutual understanding and goodwill and providing favorable conditions for one another's economic growth.

#### Training And Educating A Host of Cadres

"Six years of practice in the open door policy have also been excellent education and training for leaders at all levels and the broad ranks of cadres." Wei Lisheng concluded the discussion by noting that the open door policy has not only produced positive political effects and benefited the economy, but is also a windfall ideologically. Released from our own little cocoon, we now look at the world with a broad view. Our vision has been widened, our ideas liberated. We have become more knowledgeable and can now breathe in fresh air. International transactions and activities have made many cadres better-informed and more competent, at the same time nurturing a host of people skilled in international business.

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## FOREIGN TRADE AND INVESTMENT

### JOINT VENTURES IN GUANGZHOU JOIN ECONOMIC GROUP

Beijing RENMIN RIBAO (OVERSEAS EDITION) in Chinese 28 Dec 85 p 3

[Text] The Guangzhou Federation of Industry and Commerce held a reception today to welcome Chinese-foreign joint and cooperative ventures which have joined it as members.

Among the first Chinese-foreign joint and cooperative ventures to join the federation are 16 concerns, including China Hotel, Garden Hotel, Guangdong Guest House, China-Hong Kong Air Conditioning and Electrical Engineering Co, White Cloud Toy Factory and Renren Restaurant. In addition, 35 board chairmen, general managers and deputy general managers from 24 joint and cooperative ventures have joined the federation.

The general manager of Garden Hotel, Mr Lu Bao Jia, a Swede, attended the reception as representative of the enterprises.

Mr Guo Kewei [6753 0668 3634], deputy general manager of China Hotel for the Hong Kong side, told reporters, "I am pleased to be a new member because I will have more opportunities to exchange economic information."

Founded in 1952, the federation is a private economic group made up of enterprises and individuals from industry and commerce. Its functions are to represent the legitimate rights and interests of its members, reflect their opinions and demands to government and provide them with economic information.

The federation currently has over 2,000 members.

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## FOREIGN TRADE AND INVESTMENT

### SUZHOU, WUXI, CHANGZHOU INCREASE FOREIGN CAPITAL USE

Beijing RENMIN RIBAO (OVERSEAS EDITION) in Chinese 28 Dec 85 p 1

[Text] Suzhou, Wuxi and Changzhou, three cities with robust economic prowess, took the first steady step toward opening themselves up to the world in 1985.

During the year, a host of foreign investors came here looking for ideal business partners. The cities, for their part, despatched a string of study missions and economic delegations to Hong Kong, Macao and overseas to introduce to local businesses their agricultural and industrial conditions and attractive investment environments.

Suzhou approved as many as 44 projects involving foreign capital from last January through October, of which over 90 percent are production projects. They are valued at more than \$40 million in foreign exchange, almost double the annual total in 1984.

In Wuxi, which has had some experience in foreign capital use a few years back, 20 projects materialized this year involving direct foreign investments, including joint and cooperative ventures. The amount of foreign capital actually spent in 1985 is expected to exceed \$10 million, up 15 percent over 1984. The share of foreign capital in the total investments of these projects will increase to 60 percent from 30 percent in 1984.

Changzhou has been stepping up the construction of joint ventures so that they can go into production and yield economic benefits as soon as possible. Of the six Chinese-foreign joint ventures under construction this year, three have been completed and opened for business while construction is expected to end soon on two others.

There is a number of new features regarding the three cities' foreign economic and technical cooperation in 1985. The sources of foreign capital are being broadened, from Hong Kong, Macao and Japan to Western Europe and the U.S. The ways in which foreign capital is put to use have been diversified and refined. Compensation trade, processing and Chinese-foreign joint ventures have now been joined by other mechanisms like cooperative ventures and international leasing. Industries attracting foreign capital, formerly limited to

traditional industries like light industry, textiles and silks, have also increased to include commerce and tourism. Foreign capital now finds its way into outlying counties and the villages as well as cities.

Situated in the Chang Jiang delta, Suzhou, Wuxi and Changzhou have a solid agricultural base and a relatively well developed commodity economy. In February 1984, the Chang Jiang delta was designated as an opened coastal economic zone, creating an even more favorable environment for the region's foreign economic cooperation.

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## FOREIGN TRADE AND INVESTMENT

### GUANGZHOU USES FOREIGN CAPITAL TO IMPROVE SERVICES

Beijing RENMIN RIBAO OVERSEAS EDITION in Chinese 24 Dec 85 p 3

[Text] Through the use of foreign capital, the commercial and service sector in Guangzhou has overhauled some old enterprises, built new ones and modernized and strengthened service facilities, thus gradually solving the longstanding difficulties of finding hotel accommodation, food and means of transportation in the city.

Guangzhou's commerce and trade are tied to their foreign counterparts in a hundred and one ways. To adapt to the needs of the open door policy, scores of shops and markets have used foreign capital to renovate and remodel themselves and buy modern facilities. Nanfang Building, Friendship Store, Wailun Supplies Co and Huaxia Co, etc., have all been air-conditioned and added supermarkets to their stores. Haizhu Market has imported a number of freezers and recently put up 5 three-dimensional aquariums where a wide range of rare live seafood is displayed for customers' selection. It is now a relatively modern, large-scale general food market with a Guangzhou flavor.

Following renovations financed by foreign capital, six guest houses, including Dongfang, Lihua and Guangzhou, have become high-class hotels complete with modern facilities. Together with other new luxury hotels like China, White Swan and Garden, they provide close to 1,000 modernly furnished hotel rooms with 2,000 beds. No longer do the 2 million foreign visitors who come to Guangzhou each year have to worry about finding accommodation.

After famous restaurants like Panxi, Dasanyuan and Taotaoju were remodeled in cooperation with Hong Kong investors, the city now boasts 72,000 dining spaces. Not only do its old eateries now wear a brand new look, but also gone are the long queues that one must join in the past in order to buy a meal.

Guangzhou residents have long been plagued by the dearth of means of transportation. This problem too has now been solved by the infusion of foreign capital. According to statistics from relevant departments, there are currently 70 to 80 car-renting units in the city with a combined fleet of over 4,000 cars. All are cooperative ventures involving Hong Kong capital.

Since 1979, Guangzhou has adopted a plethora of methods to develop commercial services in cooperation with Hong Kong investors, including 26 tourist

projects with a combined capital of \$284.51 million. Priority was given to solving the problems one experienced in finding hotel accommodation, a table in a restaurant and means of transportation in order to meet the demands of the open door policy.

Guangzhou uses foreign capital to provide up-to-the-minute international services so as to improve the operating environment for enterprises. A majority of its hotels and restaurants are fitted with such trendy facilities as video game parlors, bars, bowling alleys and gymnasiums. In the past, there was a lack of recreational facilities in the city. This is now changing gradually, with a substantial improvement in economic results.

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## FOREIGN TRADE AND INVESTMENT

### SHANDONG TRYING TO IMPROVE EXPORT QUALITY

Jinan DAZHONG RIBAO in Chinese 12 Nov 85 p 2

[Article by Liu Jinzhen [0491 6855 4394], Director, Shandong Import/Export Inspection Bureau: "We Must Maintain Quality First for Exports"]

[Text] The CPC Central Committee's "Proposal" regarding the 7th 5-Year Plan states, "Increasing exports and earning even more foreign exchange is the key to implementing the open policy, using more foreign investment and importing technology." Shandong's foreign trade occupies an important place in China and therefore the task of expanding exports and earning foreign exchange will be more arduous in the future. From the perspective of Shandong's experience in commencing foreign trade, to expand exports and earn more foreign exchange we naturally must start from the export product mix, open the international market and begin export production, and make an accurate strategy that is suited to the needs of the international market and China's national conditions. Yet at the same time we must maintain the policy of quality first for all exports.

In the past year there have been rather great improvements in the quality of Shandong's exports and some changes in the export product mix. When compared with real needs, there is still a lot to be done. For example, some of Shandong's exports have a long history and are staple exports but they do not bring a good price on the international market because of quality, variety, or colors that have not been improved for a long time. The selling price of a good may be only a small fraction of that of another country's goods. The selling prices of some exports is low and the volume falls each year because of backward processing techniques or rough handiwork. Thus it is obvious that there is great potential to expand exports and augment foreign exchange earnings by improving quality. If Shandong's more than 1,500 kinds of exports can reach rather high quality standards as soon as possible they will be strongly competitive on the international market and then foreign exchange earnings will grow. We must work on many aspects to improve product quality. For example, we must use advanced technology, equipment and management methods; improve the technical and management levels of enterprises; set down perfected quality testing procedures and rigorous inspection and supervision systems, etc. Nevertheless the most crucial problem to be solved at present is an ideological one; it is also a problem of understanding quality improvements on the part of enterprise leaders and staff. Although a

considerable portion of enterprises know that quality is important, their concept of quality is no longer suited to modern needs and quality standards are backward. For example, there have been great changes in many countries' food product health requirements. The quality requirements for imported food are very strict and there are several score tests. Some enterprises mistakenly believe that their products can be sold as high quality goods and they do not try to renovate or update. Other enterprises are shortsighted. They are happy making money from domestic markets and do not try very hard to improve product quality or enter the international market. The above ways of thinking are great impediments to improving product quality and we should earnestly conquer them. Provided that the enterprise leaders and staff truly pay attention to ideological work, firmly put improvements in product quality in a very prominent place, see that everyone regards product quality as a life and death matter, and aim at the advanced world quality, then even more of Shandong's goods will take on the international market and earn even more foreign exchange for the country during the 7th 5-Year Period.

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## FOREIGN TRADE AND INVESTMENT

### FOREIGN INVESTMENT MODERNIZES SHANGHAI'S INDUSTRIES

Shanghai WEN HUI BAO in Chinese 2 Nov 85 p 1

[Article by Zhu Guangming [2612 0342 2494] and Xu Qiuliang [6079 4428 4731]:  
"New Products Emerging in Shanghai"]

[Text] Through the use of foreign capital and the import of advanced technology and management, Shanghai is forging ahead with the technical modernization of its traditional industries. Of the 141 approved Chinese-foreign joint ventures, cooperative ventures and foreign-owned enterprises, about half are in industrial production. A host of "import-substitution" and "export-oriented" enterprises are emerging.

At present foreign investors are in the grip of an ever-rising "investment fever" that has driven multitudes of small and medium-sized enterprises as well as world famous multinational corporations to Shanghai; direct foreign investments in the city have reached about \$1.2 billion. Faced with this strong influx of foreign funds, the city's foreign economic relations and trade agencies have been carefully selective in screening foreign applications, stressing the development of joint ventures making a wide range of products including woolen textiles, chemical fibers, automatic equipment, drugs, elevators, plate glass, zinc alloy toys, essence, sneakers, telephone equipment, airline food, automobiles, motorcycles and off-shore oil drilling platforms, etc. About a dozen projects have been put into production turning out products to replace what used to be imported or to be sold overseas. Thus they represent a new way whereby the municipality can save on and earn foreign exchange and open up the international market.

As most of the industrial joint ventures are technology-intensive, they play an exemplary role and definitely help promote technical modernization in their respective industries. Shanghai Volkswagen Co, a joint venture with the Federal Republic of Germany [FRG] to manufacture "Shanghai Sang-ta-na [2718 1044 4780]," is now in production with an annual output of 30,000 cars of an international standard. Not only are these cars an improvement upon the "Shanghai" brand vehicles, but some of them are also exported. The Yaohua-Pilkington Glass Co Ltd, a joint venture with Britain to make float glass; the Shanghai Bell Telephone Equipment Manufacturing Co, a joint venture with

Belgium to make program-controlled telephones; the Shanghai Foxboro Instrument Co., a joint venture with the U.S. to produce automatic meters; and the Shanghai Squibb Pharmaceutical Co, a joint venture to produce antibiotics -- all are in the international forefront in terms of technology and equipment. Some of their products and processes have filled a vacuum in China.

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FOREIGN TRADE AND INVESTMENT

TIANJIN'S HORIZONTAL ECONOMIC LINKS DISCUSSED

Tianjin TIANJIN RIBAO in Chinese 5 Nov 85 p 1

[Text] Guided by the policy of the CPC Central Committee, "Invigorate the economy at home and open the country to the world," Tianjin has made rapid progress in establishing inter-regional horizontal economic links. Formerly simple vertical operations, its economic activities are gradually moving in the direction of inter-regional and inter-industry transactions.

In accordance with the principles of doing what one does best, complementing one another, mutual benefit and joint development, the municipality has established long-term economic cooperation relations with 22 provinces and municipalities in the nation since 1980. Over the past 5 years it has obtained notable achievements through cooperation at various levels, through various channels and in various forms. Projects negotiated by the Economic Cooperation Office of the municipal government alone number 4,200, of which over 700 are joint projects, more than 2,500 involve technical cooperation and 930 involve cooperation in qualified personnel. About 50 percent of these projects have been completed or basically completed. To accommodate the development of the horizontal economy, the municipal government has set up offices in Beijing, Shanghai, Guangzhou and Shenzhen. Meanwhile over 20 provinces and municipalities have also established offices in Tianjin. In addition, the municipal Economic Cooperation Office has set up information exchange and cooperation relations with 150 units in 28 provinces and municipalities. A horizontal economic network, consisting of both horizontal and vertical channels, is taking shape. To play its role as an urban center, Tianjin has set up over 30 trade centers of all kinds keyed to the nation and put up 427 assorted technical development and consulting service organizations. These concerns have done much to promote the exchange and circulation of commodities and technical achievements. The Economic Cooperation Office alone has imported more than 100 commodities in short supply, with a total value of 1.6 billion yuan. At the same time, the municipality has helped sister municipalities and provinces develop resources, improve product quality, expand export and apply new technology.

The establishment of horizontal economic ties transcending regions, sectors, systems of ownership, cities and villages is a big part of the restructuring of Tianjin's economic system during the "Sixth 5-Year Plan" period. Experience shows that this kind of economic links will become more and more

important in the transformation of the city from a closed system to an open, multi-functional urban center.

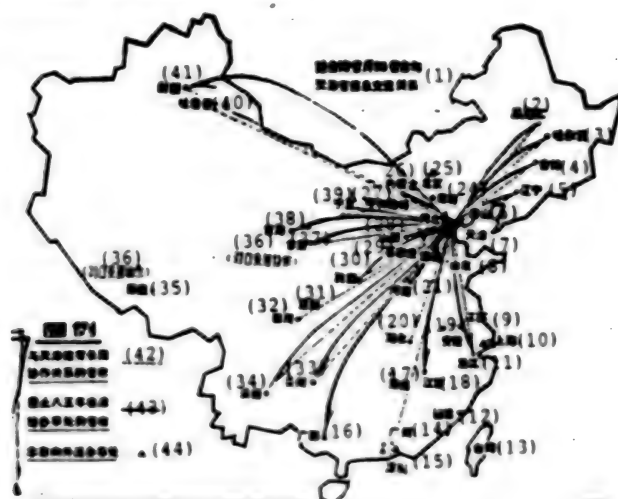


Figure 1: Network of Economic Cooperation Linking Tianjin and Sister Provinces and Municipalities

Key:

- |  |   |
|--|---|
| 1. Except for Taiwan, 28 provinces & municipalities maintain information exchange relations with Tianjin | 25. Beijing   |
| 2. Heilongjiang  | 26. Nei Menggu  |
| 3. Harbin  | 27. Huhhot  |
| 4. Jilin   | 28. Shanxi  |
| 5. Liaoning  | 29. Shijiazhuang  |
| 6. Tangshan  | 30. Shanxi  |
| 7. Tianjin   | 31. Chongqing   |
| 8. Shandong  | 32. Sichuan   |
| 9. Jiangsu   | 33. Guizhou   |
| 10. Shanghai   | 34. Yunnan  |
| 11. Zhejiang   | 35. Xizang  |
| 12. Fujian   | 36. receiving assistance from Tianjin geared to local needs |
| 13. Taiwan   | 37. Gansu   |
| 14. Guangzhou  | 38. Qinghai   |
| 15. Shenzhen   | 39. Ningxia   |
| 16. Guangxi  | 40. Tulufan   |
| 17. Hunan  | 41. Xinjiang  |
| 18. Jiangxi  | 42. Have longstanding cooperative relations with Tianjin    |
| 19. Anhui  | 43. Have offices in Tianjin as of 1985                      |
| 20. Hebei  | 44. Where Tianjin offices are located                       |
| 21. Henan  |   |
| 22. Handan   |   |
| 23. Hebei  |   |
| 24. Langfang   |   |

## FOREIGN TRADE AND INVESTMENT

### TIANJIN JOINT VENTURES HELD SUCCESSFULL

Chengde JINGJI XIAOXI [ECONOMIC NEWS] in Chinese 6 Nov 85 p 1

[Text] A Tianjin joint venture manager revealed that both sides are quite satisfied with the economic benefits of joint ventures in Tianjin that stress the foreign exchange balance to ensure that operations are entirely smooth. Some 34 of the existing 36 Tianjin joint ventures are profitable. Only 2 of them had losses, totalling RMB 120,000 yuan in the first one-half of this year. A turn for the better is already visible. It is estimated that deficits can be recovered by year-end.

When starting Chinese-foreign joint ventures the city strictly examines the ventures foreign exchange balance. Ventures that cannot achieve a balance are definitely not approved. Tianjin's main method is to require that goods produced by the enterprise itself are put on the international market and foreign exchange income is directly collected. By guaranteeing the state's revenues and making foreign businessmen's profits easily remitted, both sides are activated. Additional revenues this year are within sight for a coastal shrimp farm cooperative venture between Hong Kong and Tianjin businessmen. The parties involved are discussing turning their cooperative production into a joint venture. This year profits increased for the Jinhua Pan Needle Works, one of the first joint ventures, and goods produced by it entered the international market for the first time. This is the result of joint efforts by both parties. Furthermore, because of budgeted foreign exchange profits that can be distributed each year, the Chinese-French Grape Rice-Wine Co Ltd and the Li Ming Cosmetics Industry Co Ltd completely accept joint ventures. This year they decided not to remit their profits abroad but to make additional investments and expand construction in China.

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FOREIGN TRADE AND INVESTMENT

TIANJIN FOREIGN TRADE CONFERENCE IDENTIFIES PRIORITIES

Tianjin TIANJIN RIBAO in Chinese 17 Nov 85 p 1

[Article by Yue Qingjun [1471 7230 0689]: "Tianjin Foreign Trade Conference Reviews Work"]

[Text] The 4-day Tianjin foreign trade conference, which heard experts, scholars and people actually in foreign trade deliver 10 papers, closed on the 15th. The president of the China Trade Center, Zou Siyi [6760 2448 7328], specially wrote from New York, U.S., putting forward his views and suggestions. After full discussions and deliberations, the conference basically approved the general report for submission to the municipal CPC committee and municipal government. Yang Jingheng [2799 4552 5899], member of the standing committee of the municipal CPC committee, presided over the closing session while Zhang Zhaoruo [1728 2507 5387], chairman of the municipal Foreign Economic Relations and Trade Commission, gave the concluding address.

It is the sense of the conference that foreign trade is a total, comprehensive activity the development of which requires coordination and concerted efforts between all industries, all trades and all sectors. Accordingly, we should highlight the importance of promoting foreign trade vigorously by considering it part of the economic development strategy of a coastal economic urban center and make it a prominent part of economic work.

The conference discussed the following issues:

1. Speed up the training of personnel in international business and trade. We must use a variety of methods, channels and levels to develop personnel skilled in foreign business, paying particular attention to the development of foreign trade strategic decision-makers.
2. Strengthen foreign trade information and consulting services, take market surveying and research seriously and gradually build up and perfect a network where information flows horizontally as well as vertically.
3. Use flexible and diverse methods of trade. Even as we devote ourselves to the expansion of commodity trade, we must try hard to develop technical trade

and promote such non-trade services as project contracting, tourism, ocean shipping and overseas investment, among others.

During the conference Tan Shaowen [6223 4801 2429], deputy secretary of the municipal CPC committee; Yang Jingheng, member of the standing committee of the municipal CPC committee; Li Lanqing [2621 1526 3237], vice mayor; and Zheng Wantong [6774 5502 6639], secretary general of the municipal CPC committee, made a special trip to the guest house to call on out-of-town delegates as well as some local delegates.

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CSO: 4006/628

## FOREIGN TRADE AND INVESTMENT

### ZHEJIANG OFFERS PREFERENTIAL TREATMENT TO INVESTORS

Chengde JINGJI XIAOXI [ECONOMIC NEWS] in Chinese 6 Nov 85 p 1

[Text] At the Zhejiang Foreign Trade Conference Governor Wu Minda [0702 2404 6671] announced to more than 300 foreign businessmen from 16 countries and regions that those who invest in and cooperate with Zhejiang can enjoy the following preferential treatment.

Foreign-investment joint venture, cooperative or foreign-owned enterprises of a productive nature that are opened in the open economic and technical area can be exempt from income taxes and foreign businessmen's share of legal profits can be remitted abroad and shall be exempt from remittance taxes.

With approval, the enterprise income tax of technology- or knowledge-intensive enterprises or projects that have an investment of more than \$30 million with a long recovery period that are located in old areas of Ningbo or Wenzhou, or the open economic areas of Jiaxing or Huzhou shall be reduced to 15 percent, and businessmen's profits shall be exempt from remittance taxes.

The income tax shall be reduced to 15 percent for foreign-investment projects in the areas of energy, transportation or harbor construction.

Imported raw materials, parts and personal communications tools and materials for daily use in cooperative or joint ventures or foreign-owned enterprises that produce exports shall be exempt from customs duties and the Consolidated Industrial and Commercial Tax on imports.

Joint or cooperative ventures or foreign-owned enterprises that provide advanced foreign techniques, technology, equipment or goods that can replace imports shall be permitted to sell a certain proportion of their goods in China.

Exports of goods produced in the aforementioned categories (excluding goods prohibited for export by the state) shall be exempt from export duties and the industrial portion of the Consolidated Industrial and Commercial Tax.

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CSO: 4006/537

## FOREIGN TRADE AND INVESTMENT

### IMPORT OF SECOND-HAND EQUIPMENT DISCUSSED

Beijing GUOJI MAOYI WENTI [INTERNATIONAL TRADE JOURNAL] in Chinese No 5, Sep-Oct 85 pp 28-32, 48

[Article by Zhang Jinxi [1/28 6651 3886]: "A Preliminary Look at the Import of Secondhand Equipment"]

[Text] There is a need for exploratory research on both the theory and practice of the import of second-hand equipment. As our economy develops rapidly and urban and rural economic reforms become more far-reaching, the import of such equipment will gain increasing prominence. In the past we were more concerned to import advanced technology and equipment per se than technology and equipment suited to China's circumstances and almost ignored the import of second-hand equipment. Only in the last couple of years has this situation changed. It is clearly profoundly significant for the four modernizations that we practically strengthen our leadership over the import of second-hand equipment and intensify our theoretical research on it.

#### I. The Need For Importing Second-Hand Equipment

The most glaring problem in China's economic development at present is its backward productive forces. And a key method of improving our backward productive forces is developing science and technology. In general there are two approaches to scientific and technological development. First, we can encourage the nation's scientific and technical personnel to innovate, conduct creative research and development [R & D] and promptly apply new scientific and technical achievements to the realm of production, thereby converting science and technology into productive forces. In the second approach, we learn and absorb advanced foreign scientific and technical achievements, carry out imitative R & D and directly apply them to production. Alternatively we may engage in destructive research, such as reverse engineering and, by dismantling a product, explore the characteristics and manufacturing process of its raw and other materials, the processing equipment used in its production, its processing technology and its design process so as to master its entire production technology. Given the present backward state of China's science and technology, the latter approach assumes particular importance and constitutes a shortcut to the development of science and technology. The import of second-hand equipment not only directly provides us with production hardware but also furnishes reverse engineering with inexpensive data.

Of China's 40 million enterprises, a substantial portion operate with outdated equipment and are technically backward. They have an urgent need to modernize their equipment, a task currently beyond our capability: we can only spend our limited foreign exchange on the nation's priority projects. The first problem we encounter in importing advanced foreign technology and equipment to replace the obsolete equipment at home is high prices. Next we run into the problem of our inability to assimilate what we purchase from abroad. High prices effectively limit our purchasing power and the quantity of our purchases, while a failure to assimilate imported equipment or to integrate it into our production setup results in waste. The import of second-hand equipment is a satisfactory solution to both problems; second-hand equipment is inexpensive and easier to assimilate.

## II. What Is Secondhand Equipment?

What is second-hand equipment? Some people think it is old equipment or used equipment. Not so. Secondhand equipment includes new as well as old equipment. Old equipment may mean depreciated but usable equipment or depreciated, unusable equipment. It may also mean used but undepreciated equipment which retains some use value. Defined in the last manner, old equipment means the same as used equipment and the two expressions are interchangeable. Secondhand equipment, on the other hand, has a broader meaning. Some second-hand equipment is new equipment. For example, a factory goes broke and is forced to sell off as second-hand equipment the machinery it has ordered and never used during the liquidation proceedings. Some of the equipment on order may have been delivered while some may still be being produced. All this should be included when we consider second-hand equipment. Not only is this equipment entirely new, but it is also inexpensive and ideally suited for direct production once acquired. Some second-hand items which are relatively old are even less expensive and can be used in reverse engineering, a much more economical move than buying brand-new materials and equipment for that purpose. Of course where the project involves the study of state-of-the-art technology, we have no choice but to use the latest products. Sometimes a factory, for a variety of reasons, is forced to part with a piece of equipment it has bought to cut losses. This kind of equipment is also a suitable candidate for second-hand purchases. For example, a Brazilian company has resold to the Beijing Guangda Industrial Company a number of West German trucks, which it had purchased without taking into account the country's equatorial rain forest climate.

Secondhand equipment by and large can be classified in the following ways: by its newness, in which case it can be completely new, relatively new or semi-new; by the scale of the purchase: it can be a single piece of key equipment, a production line, a whole set of equipment or an entire plant; and by the financial status of the seller: the equipment may be put up for sale by a liquidation committee, by a profiteering middleman or by a factory strapped for cash or switching to another line of product.

There is a common tendency to opt for relatively or completely new second-hand equipment. But circumstances differ from case to case; we should decide how old or new a piece of equipment we should buy by analyzing the facts of the



case in hand and the uses to which the equipment will be put. As far as the scale of the purchase is concerned, the rule of thumb is to buy a production line rather than a piece of equipment, and to buy an entire plant rather than a production line. This is because if we look at the price of a piece of equipment, the bulk of it is accounted for by the key equipment and main production line, with the accessories costing next to nothing. Say you want to buy the engine of an old ship. Rather than buying just the engine, you would do better by buying the entire ship because the engine often costs as much as the ship. By buying the entire ship, you acquire the ship plate and other accessories.

What is presented above is only a crude classification of second-hand equipment. It gives us a preliminary idea of a subject which is more complex in reality. There is no need to go into detail here.

### III. Characteristics Of The Import Of Second-Hand Equipment

The most outstanding feature of importing second-hand equipment is its inexpensiveness.

If its patent period has already expired when we buy a piece of second-hand equipment, and if the seller is the patentee, we will take possession of the patent as well as the equipment. In the West, a patent is usually good for 15 years or more. It is not an infringement of a patent to buy a piece of equipment used for the manufacture of a product covered by an unexpired patent.

Importing second-hand equipment is often a way to get around the export restrictions of foreign governments. There is some equipment which cannot be exported in a brand-new state. If it is second-hand, however, it is not subject to that restriction. Examples are certain equipment which makes military hard-ware and cutting-edge products.

Second-hand equipment is often superior in that it fits China's circumstances, that is, the standard of the country's productive forces. Generally speaking, we should consider the following factors when we import technology and equipment: 1) Does the nation need it urgently? 2) Do we have the funds for it? 3) Is it on the restricted list of a foreign government? 4) Does it reach a definite advanced level? 5) Can we assimilate it? This list is certainly not exhaustive. Of the five factors, the first one is undoubtedly a prerequisite. Both the second and third factors apply to the import of second-hand equipment. We should be particularly mindful of the fourth factor when we import second-hand equipment; we have no use for obsolete equipment which should be eliminated. The last factor is also relevant to second-hand equipment import: often the latest equipment we cannot assimilate while what we do need most is technology and equipment which may not be state-of-the-art but which suits our national conditions best. Since it is inexpensive, we will not balk at discarding or replacing a piece of second-hand equipment after it has served our purpose for some time. With its short life cycle, second-hand equipment fits in nicely with the ever-changing nature of modern science and technology and the versatility of modern production. Large, self-contained equipment which lasts and lasts cannot keep up with the frantic pace

of scientific progress today. The contemporary trend is toward small, self-contained industrial structures. To borrow a term from weiqi, the structure should be light and flexible, not unwieldy.

#### IV. The Possibility Of Importing SecondHand Equipment

The possibility of importing second-hand equipment is in effect a question of exploiting the capitalist economic crisis. We know that economic crises in the capitalist world are cyclical. During a capitalist crisis, large corporations are stuck with surplus capacity and may suspend operations and production, while there is a wave of bankruptcies among small and medium-sized enterprises. This is an excellent opportunity for importing second-hand equipment. In the early 1930's, for instance, the Soviet Union made good use of the Depression in the capitalist world by importing vast quantities of equipment. At the time it was the largest importer of foreign machinery in the world, purchasing one third of total world machinery exports in 1931 and one half in 1932. Only during the Second 5-Year Plan (1933-37) did it cut back on foreign machinery and equipment purchases due to an increase in its own production capacity. Among equipment bought by the USSR, a considerable portion consisted of second-hand equipment, key installations, even entire plants, bought from Western factories which had gone bankrupt. The import of machinery on this massive scale enabled the Soviet economy to grow rapidly and helped lay a solid material foundation for Soviet victory in its anti-fascist struggle during World War II. For instance, the tractor plant it imported during the Depression switched to making tanks during the war. We should learn from the Soviet experience in exploiting the capitalist economic crisis.

Since 1975, the capitalist world has been plagued by stagflation which has not yet run its course. Although the U.S. economy has bounced back fairly strongly in the past 2 years, the recovery may be a temporary phenomenon. With capitalism in the throes of structural readjustment and recession a frequent occurrence, some enterprises will go out of business while others will switch to another line of product, reorganize or merge with another firm. It is an important part of our import of advanced technology and equipment to make use of this situation to make some good second-hand buys.

When recession hits the capitalist world, small and medium-sized enterprises are the first to suffer. And it is the equipment of just these enterprises which is often most suited to the standard of our productive forces and is easier to absorb and assimilate. As it is inexpensive and can be put into production and produces results quickly, it should be what we go after when we import second-hand equipment.

Even when capitalist economies are booming, corporate bankruptcies, closures, mergers and changes in production lines happen frequently. As long as we keep ourselves well informed, opportunities for second-hand purchases are everywhere.

## V. Major Links In Second-Hand Equipment Import

The import of second-hand equipment belongs to the realm of the import of technology and equipment. But even though it is similar to the latter as generally defined, it has its own special features resulting from the uniqueness of the second-hand equipment market. The main difference is this. The technology and equipment market as we normally understand it is relatively stable. A buyer can buy off the shelf, so to speak, or place an order. Buying and selling are conducted step by step in accordance with regular procedures; the whole transaction is more susceptible to planning. The second-hand equipment market is radically different in that it changes by the minute. Where and from whom you can buy second-hand equipment is purely accidental and unpredictable. There is a high degree of fortuity about the entire process. This fortuity determines that when we import second-hand equipment, we must come to grips with three important links: information, qualified personnel and the simplification of import procedures. Let's examine them in turn.

(1) Information. The importance of information in international economic intercourse today is self-evident. No information, no deal. Information is of special importance to the import of second-hand equipment. This kind of information is also extremely volatile. Information on the second-hand equipment market can be divided into two kinds, supply and demand. Supply information pertains to the seller and since it originates abroad, we also call it foreign information. Domestic information pertains to the buyer and since it originates at home, we also call it domestic information. Combine these two kinds of information, and you satisfy the minimal condition for a deal.

Foreign information, for one thing, is usually unstable, changeable and highly time-dependent. If we are indecisive, we stand to lose a good opportunity. Once a seller has sold a certain piece of second-hand equipment, we will not be able to buy from him the same kind of equipment. This situation is rather like an auction. Second, this being a big world, suppliers and sellers abound. So we can say foreign information is inexhaustible.

To get hold of foreign information, we need more than second-hand equipment import personnel who keep their eyes and ears open. We must also establish an information network on the second-hand equipment market and seek to understand foreign information through our commercial counsellors' offices, banks, embassies and other Chinese institutions overseas. Study missions are another way of getting to know the second-hand equipment market. Of these methods, researching the second-hand equipment market in the course of regular transactions with Chinese banks overseas and foreign banks is of particular significance. This is because we purchase much of our second-hand equipment from factories going under. For instance, the motorcycle plant imported by the International Trust Investment Company from Germany on behalf of Tianjin was bought from a concern which was going out of business. Under normal circumstances, when an enterprise goes under, a bank steps in to take care of the liquidation proceedings. Banks, therefore, have direct access to information on second-hand equipment market. Another approach is through study missions, which of course does not mean that we must send delegations

overseas charged with the special task of studying the market for second-hand equipment. But it does mean including a second-hand equipment investigator in the various study delegations we despatch abroad or appointing a delegate to double as second-hand equipment market investigator. This method provides first-hand data.

The understanding of the market for second-hand equipment should become part of the daily work of our commercial counsellors' offices, banks, embassies and other Chinese institutions overseas for which a specific employee will be held responsible. We must put an end to the lack of involvement by banks in the import of second-hand equipment, something which cannot be accomplished without a circular from the State Council explicitly to that effect. The plethora of Chinese institutions abroad collecting information and channeling it toward the organizations at home which deal with second-hand imports; these organizations, in turn, forwarding it to domestic users and pulling together domestic and foreign information -- this is information-gathering by key points.

There is also a surface approach to gathering information, which essentially means understanding the foreign second-hand equipment market via middlemen. Middlemen may and may not be overseas Chinese businessmen who, scattered all over the world, are a force in the four modernizations not to be ignored. Through them, we can gain access to an even larger spread of information. By combining the point approach with the surface approach, we can ensure a smooth flow of information, a prerequisite for the import of second-hand equipment.

Domestic information pertains to what domestic users demand. China is a vast country with myriad enterprises, many of which are in desperate need of technical modernization and equipment renewal, so there is also a wealth of domestic information. Compared to foreign information, however, domestic information is of a smaller quantity and also more stable. Collecting domestic information is correspondingly easier. We can send out letters of inquiry or conduct face-to-face talks. The information thus collected can be stored in agencies in charge of second-hand import to form a user information bank available for inspection anytime.

Which should we come to grips with first, foreign or domestic information? There is no hard and fast rule. Generally speaking, we should first zero in on the more straightforward part of a task. Accordingly, we should begin by concentrating on and mastering the domestic demand end, followed by an effort to look for sellers abroad. If we do it the other way round, that is, concentrating on foreign information first and then looking for domestic users, we may not be able to come up with them at short notice and hence let a good opportunity slip by. Of course this does not apply to all cases.

To understand foreign supply information and domestic demand information requires a spirit of full cooperation. Agencies which play a part in providing second-hand equipment information -- commercial counsellors' offices, banks, embassies and other institutions overseas -- belong to different sectors. If they lack a spirit of cooperation for the sake of the four modernizations, our work will come to nothing. Real-life instances abound of cooperation making the difference between success and failure.



To come to grips with foreign information, we must adapt ourselves to its special characteristics of volatility and time-dependency. To get a firm grasp of domestic information, we must do likewise with its characteristics of accuracy and suitability. Full coordination between the gathering of domestic and foreign information is the essence of second-hand equipment information work.

(2) Qualified personnel. Once information is in hand, we still need a host of people with both technical expertise and business skills if we are to use our information well and strike a deal. Without such people, we will have a lot of difficulties. We know from experience that an outstanding foreign trade worker lacking technical or professional competence hesitates to import an item even though he knows it is available because he cannot tell whether it is good or bad. Conversely, the technical expert who knows nothing about foreign trade is at a loss as to how to go about importing foreign equipment. When it comes to actually importing technology and equipment, therefore, we are in effect forced to mobilize both the trade expert and the technician, which often means putting three or more people in the field to tackle one single foreign businessman. The inefficiency of such an approach is obvious and all because our foreign trade personnel know nothing besides foreign trade. Rare are those who have both technical and trade skills. And if they happen to come from different sectors and are answerable to different bosses, cooperation will be even more fraught with difficulty. This happens often in equipment and technology import. Hence the need for a major effort to train foreign trade personnel proficient in technology as well as trade.

(3) The simplification of import procedures. The special quality of the market for second-hand equipment determines that the import of such equipment cannot follow established procedures as rigidly and bureaucratically as conventional technology import. It has no room for buck-passing and step-by-step examination and approval. Personnel in charge of second-hand equipment must have the authority to make on-the-spot decisions, so the simplification of import procedures and the reform of the management system are critical issues in the success of second-hand equipment import. In our experience, it is a sound approach to delegate the implementation of a project to the project manager, give him full power to oversee the whole project from beginning to end and make him answerable to the board of directors.

(4) The pricing of second-hand equipment. Should the price of a piece of second-hand equipment be determined entirely through the bargaining process during negotiation? Not quite. In the case of some old equipment, their prices are decided by their depreciation period and usually hover around the original price minus depreciation. In the U.S., plants, machinery and means of transportation are depreciated in 10, 5 and 3 years respectively. If the seller of the equipment in question is an enterprise going broke, its price usually approximates the amount of debt owed the creditor. As long as the price offered basically pays off the creditor, it will be acceptable to the seller. When a piece of equipment is put up for sale because its owner is strapped for cash, an acceptable price will be one which will put enough cash in the seller's hands to solve his cash flow difficulties. There are other situations in which an enterprise made an ill-considered purchase and has no



choice but to resell it. This kind of seller wants to make good his losses to the greatest extent possible and will be happy provided he can cut his losses. In these cases, prices are determined by negotiation.

To capture the initiative in second-hand equipment price negotiation, we must first have a clear idea of the seller's credit position. Combine this knowledge with negotiating skills and an understanding of his psychology and we can clinch a deal.

(5) One of the characteristics of the demand information of domestic users is that it is clouded with preconceived notions. Some domestic users, for instance, are so convinced of the virtues of a particular product or equipment that they insist on it even though it may be obsolete or is no longer in production. The foreign businessmen benefits from our obsession in two ways: he can unload on us his outdated equipment and makes a handsome profit in the process. This mentality among domestic users, a result of lack of information, militates against our economic development. Japanese merchants, for instance, have shrewdly taken advantage of it and enriched themselves by dumping substandard, outmoded equipment on us. We must give this problem full consideration.

Now and then domestic users also get into a buying stampede and bid up prices, in sharp contrast to our exporters who try to outsell one another by slashing prices. Guangda Company, for instance, imported a set of equipment from the U.S. After they got wind of this purchase, several other users also quoted prices to U.S. firms. In the end, the State Economic Commission was forced to step in and imposed a centralized system. Only then was the import successfully concluded.

As far as China is concerned, the import of second-hand equipment is new territory. The above discussion is essentially a summary of our experience in this novel area. The theoretical aspect is preliminary, exploratory and very immature. The purpose of the article is to elicit more thoughtful ideas and more writings on this topic so that the import of second-hand equipment will be more successful.

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## FOREIGN TRADE AND INVESTMENT

### CHINESE COLOR TV INDUSTRY ENTERS INTERNATIONAL MARKET

Beijing RENMIN RIBAO OVERSEAS EDITION in Chinese 16 Dec 85 p 3

[Text] China's color television sets have begun making their way into the international market, according to the WENHUI BAO. Beijing alone exported 20,000 sets of the "Peony" and other brands to Western Europe and Southeast Asia this year, earning \$5 million in foreign exchange for the nation. It is learned that China will export TV sets on an extensive scale next year, of which color sets will account for one third.

Currently China has four major color TV set production centers, turning out such well-known brands as "Beijing," "Panda," "Gold Star" and "Peony." On average a Chinese color TV can operate for 15,000 hours without a break-down. Our TV sets have attained the standard of similar products in other parts of the world.

The rapid growth of China's color TV industry can be traced to our import of advanced foreign technology. Since 1980 we have successively imported 70 color TV assembly lines to make complete sets and a number of production lines to make components and accessories, which laid the foundation for our color TV industry. At present the industry is trying to achieve two major strategic shifts: from depending on imported technology to manufacturing complete sets domestically, and from satisfying the domestic market to making our entry into the international market. To that end, the Ministry of Electronics Industry has made plans for the gradual domestication of the TV industry. Beginning next year, the price of Chinese components as a portion of the price of a complete set (excluding the picture tube) will be raised to 70 percent and, in some cases, 80 percent. This must be achieved without lowering the quality of the machine as compared to its imported counterpart. In this way, the amount of foreign exchange spent on each color TV set can be lowered from its present level.

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## FOREIGN TRADE AND INVESTMENT

### CHEMICAL INDUSTRY BOOSTS EXPORTS

Beijing RENMIN RIBAO OVERSEAS EDITION in Chinese 24 Dec 85 p 3

[Article by Xing Fengbing [6717 7685 3521]: "Outstanding Export Record for Chemical Industry during the 6th 5-Year Plan"]

[Text] During the "Sixth 5-Year Plan," agencies in chemical industry vigorously promoted the import and export of chemical industrial products and obtained solid achievements in importing technology and equipment, exporting products, bidding for foreign projects and labor cooperation, etc. This was revealed at the national chemical industrial import and export work conference held in Beijing. Preliminary statistics show that chemical industrial imports and exports totaled \$19.9 billion during the past 5 years, up 70 percent over the "Fifth 5-Year Plan" period. Chinese chemical industrial exports include organic industrial chemicals, rubber products, dyes and paints, and earn \$700 million in foreign exchange each year.

During the "Sixth 5-Year Plan," the chemical industry imported a total of 466 pieces of advanced foreign technology and key equipment at a cost of \$750 million. There are several gratifying trends about the imports. First, more and more of them are used to modernize existing enterprises technically. Of the 63 deals made in 1984 alone, 44 involved technical modernization. Second, imports have become more diversified. Instead of buying mostly whole sets of equipment as we did in the past, now we shop for software, design and make hardware in cooperation with other nations, and buy patented technology and key equipment in an all-out effort to save foreign exchange for the country. Third, we now buy from a widening range of nations and regions. Apart from dealing with developed nations like Japan, the U.S. and the Federal Republic of Germany, we have also strengthened cooperation and trade ties with the Third World and nations in Eastern Europe.

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## FOREIGN TRADE AND INVESTMENT

### NECESSARY CONDITIONS FOR JOINT VENTURES

Tianjin KEXUEXUE YU KEXUE JISHU GUANLI [SCIENTIOLOGY AND MANAGEMENT OF S&T] in Chinese No 2, 1986 pp 6-7

[Article by Keizo Umeda, Himeji Junior College, Hyogo Prefecture, Japan; rewritten by Yong Qian [0516 3677], Zhao Beiwan [6392 054 2598], chief editor: "Necessary Conditions for Joint Ventures"]

[Text] In a world where science and technology progress day by day, it is rather difficult to be outstanding among other competitors; therefore, every enterprise tries to change the structure of its industry and technology and consolidate its position through joint ventures.

However, there are also lots of examples of termination of an agreement of cooperation among the developed countries. At present, the conflicts are acute. In general, joint ventures have the following problems:

1. The items of joint-venture enterprise are more mature, so the introducing country loses the characteristics of being a new producer and also loses the true significance of joint ventures. Thus a joint-venture enterprise can be banned easily by the mother company.
2. Owing to the recession of joint-venture enterprises, their strategies of management must change; otherwise the result will be that the investor country cuts its investment and limits it to a small amount of capital or recalls its total investment. Consequently, the other party revokes the administrative power of the investor.
3. The elimination of obstacles to both parties on the basis of mutual understanding and mutual trust between the two partners not only in appearance and formality but also in an honest and sincere exchange of opinions and management.
4. In case difficulties or problems in management emerge in the mother company, the contract is cancelled and the enterprise is managed independently by a single party.

Therefore, it is necessary to summarize conscientiously the causes of failure of joint-venture enterprises and pursue the ways and means of success and improvement.

Sources from multinational enterprises in Europe and Japanese enterprises abroad reveal that the causes of failure of joint-venture enterprises can be summed up as follows: incomplete market research and inadequate investigation within the enterprise, poor management by the mother company, and a change in foreign investment from the mother company.

The causes of failure from the local society include inconsistency of opinions with the [mother?] company and external causes, mainly from an economy that is overproducing. To avoid the above-mentioned occurrences, the key is to maintain harmony with the local enterprises and collect information from the client countries to become mutually prepared; select the places for local investment, analyze the characteristics of the products and the competitive situation, predict the buying power of the joint-venture enterprise, and determine the purchasing price, conditions, and commercial customs, according to the size of the market; and analyze, through the cycle and according to the cost of transportation, the conditions for production equipment, materials, regulations about the social effects of pollution, and labor in order to explore the productivity of the enterprise, the tax system, capital transfers, and the budget. The most important among the conditions mentioned above is how to make a selection. It affects whether the enterprise can be successful or not. Besides, it is necessary to study further the culture and history of the host country in order to communicate for the joint-venture enterprise and eliminate misunderstandings. Also attention must be paid to the distribution of authority. It is necessary to conduct technology transfers and develop new technology on a broad scope from manufacturing and processing to management.

In technology transfers, it is important to introduce new technology; however, it is even more important to develop new technology. If new technology is developed, there will be room in both the developed and the developing countries for technology transfers. Modern multinational enterprises do not rely on capital or ownership but pay attention to the distribution of production in order to enhance the cooperation between East and West.

Nevertheless, the essence of joint-venture enterprises is to enable the partners to draw on the strengths of each to offset the weaknesses of the other to maintain the cooperative system. Once mutual trust is established among the partners, it is necessary to overcome any difficulties; otherwise, that organization is bound to collapse, no matter what it is. This is what we should always remember.

But in the past few years, the international investment environment has changed and some new problems need to be solved urgently. As we saw in Iran, even in a so-called stable market and host country, with revolution, internal disorder, and war and with the ending danger of a termination of the projects in progress and a takeover of capital before fulfillment of the contract, the future situation can be hard to imagine. Countries with an accumulated debt include most developing countries striving to carry out their economic



policies but these countries are still thought to be the most promising countries as host countries for investment. However, because of the accumulated debts, the profit received by the host country is greatly limited and, as a result, the reinvestment of that profit in the host country by the investor is limited.

Thus, there are strategic measures such as the signing of an investment protection agreement between the investor and host countries in order to lessen or minimize the investment danger.

In China there are in general many achievements in the acceptance of foreign investment, but the following problems still exist: 1) there is more cooperation based on an agreement but few on joint venture; 2) more capital comes from Hong Kong and Macao compatriots and little comes from foreign enterprises, or consortiums; 3) there are more medium-size and small items but few large ones; 4) there is more investments in tertiary industries but little in manufacture for export; 5) in intended investments which have been revealed, there are more items which require longer terms of negotiation while few eventually arrive at a satisfactory conclusion; 6) the amount of investment stipulated in the contract is high while the actual investment is low; 7) more foreign investment is introduced but foreign exchange created with the foreign investment is little.

In joint-venture enterprises with investment from Japan, from basic enterprises to enterprises representing a great volume of trade, and if underwater operations are included, along with the increase in the number of joint-venture enterprises, the kinds of the enterprises have also expanded in many aspects, from the servicing and manufacture of motors or generators and fiber products to the manufacture of automobiles.

The reasons for the rapid growth in Sino-Japanese joint ventures are, first, because China has made great efforts to expand favorable treatment and enhance the law. However, the problems caused by the increase of joint-venture enterprises have become cleared. The main problems are the following: now, in the joint venture, the most troublesome thing for the Japanese party is the pricing of land and the second is the insufficiency of transportation at the harbors, which affects exports. Therefore, the harbors need to be reorganized and enhanced and new ones built. Third, people do not quite trust the supply of energy and raw materials. Though the supply of energy and raw materials for joint-venture enterprises has priority, severe energy shortages in the country exist, especially in electricity, and when joint-venture enterprises increase later on, the stable supply of electricity in some places may experience some difficulties. Fourth, the sovereignty of labor enterprises, yet the enterprises can only recruit workers in the suburbs; they hope to recruit the finest workers in a wider area but there exist difficulties in applications for residence in the municipalities. Furthermore, wages tend to rise, especially when there is a shortage of people who can speak foreign languages, and their wage increases have been great. Besides, there are some problems in labor control. In the establishment of some joint enterprises, some managers think they must fully realize the meaning of the existence of the labor union. The fifth problem relates to the regulations about the

distribution of foreign exchange and the strengthening of the obligations to export. Owing to the strict control policy over foreign exchange, joint-ventures enterprises or those based on technological cooperation with foreign countries worry about their production being caught up in difficulties, and so foreign exchange capital must be positively supplied for the importation of advanced foreign technology by local export industries. If foreign exchange capital becomes more flexible and accommodating, the foreign exchange control will be relaxed a little, and thus the obligation to export for the joint enterprises will be strengthened. Sixth, along with the progress of technology transfer, some disputes over the expense of technology transfer will arise. In the introduction of foreign advanced technology, some Chinese in charge do not know about paying technology consulting fees, fees for using others' patents, and deposits for security. For example, the unwillingness to acknowledge the value of some technologies is the biggest stumbling block in the trade for foreign enterprises to transfer technology to China. In the future, in the cooperation between China and foreign countries, if China does not acknowledge "technology fees," the work of introducing advanced technology will not be able to proceed smoothly. The seventh problem is the restriction of investment proportions in joint enterprises. China has strict restrictions on the number of enterprises that have foreign capital in the majority, which is contradictory to the regulations of joint-venture enterprises. The final important thing is the terms of the joint enterprise. The Japanese enterprises hope that the term designated by the current regulations will be extended appropriately.

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## FOREIGN TRADE AND INVESTMENT

### BRIEFS

TIANJIN JOINT VENTURES--Tianjin's 50 Chinese-foreign joint ventures now in business reported sales of more than 100 million yuan and a profit rate of 24.5 percent in the first 3 quarters of this year. This was disclosed by a leading cadre from the Tianjin Foreign Economic Relations and Trade Commission at the second meeting for Chinese-foreign joint ventures yesterday. He also revealed that a vast majority of the 50 joint ventures have either balanced their foreign exchange income and expenses or achieved a surplus. Six of the 50 concerns have recouped their investments, while business is improving at 3 others operating in the red so far. By year end two of them will have eliminated their book deficits. [Article by Hao Zhaoguang [6787 3564 0342]] [Text] [Tianjin TIANJIN RIBAO in Chinese 17 Nov 85 p 1] 12581

CSO: 4006/628

## SPECIAL ECONOMIC ZONES

### LIANG XIANG ON SHENZHEN'S ACHIEVEMENTS

Beijing RENMIN RIBAO (OVERSEAS EDITION) in Chinese 13 Dec 85 p 3

[Text] The Shenzhen Special Economic Zone [SEZ] has been established for over 5 years now. How is it faring? What are its prospects for development? These questions, which interest everybody in the nation, were answered in a status report by Liang Xiang [2733 4889], secretary of the Shenzhen Municipal CPC Committee, to a general meeting of cadres from departments directly under the CPC Central Committee.

Liang Xiang said that since there was no precedent of a socialist nation establishing special economic zones, Shenzhen had to grope its way forward, based on the CPC Central Committee's intent and demands. Over the past 5 years, the municipality was preoccupied with laying a solid foundation. Its achievements are mainly in the following four areas:

Establishing a relatively attractive investment environment. Shenzhen was originally a small desolate border town, with a very backward infrastructure, especially in energy, telecommunications and transportation. Today we have built or expanded 80 urban roads and established three industrial districts at Shekou, Shangbu and Bagualing, which have begun to take shape; the construction of four others, including Shahe, is in full swing. We have also completed a host of projects in education, tourism, commercial services and municipal administration. The Shajiao Thermal Power Plant was built with foreign capital. The rudiments of a sea and land communication network are in place, consisting of a heliport and four wharves. Already in operation are 11,000 program-controlled telephones, providing direct-dial access to Hong Kong and a dozen cities on the mainland.

Capital projects in the past few years represented \$6 billion yuan in investment and provided new footage totalling 8.08 million square meters. They were primarily financed by foreign capital, local funds, investments by enterprises in the interior and bank loans. Direct state investments were minimal.

Importing a quantity of foreign capital and advanced technology. Businessmen and firms from 17 nations and regions have invested in Shenzhen. As of October this year, Shenzhen has concluded 4,300 agreements with overseas

investors, with a total value of \$3.1 billion, of which \$840 million have actually been invested. The latter figure accounts for one seventh of total direct foreign investments in China. We have imported over 30,000 pieces (sets) of equipment of all kinds, of which 40 percent are relatively advanced. A number of wholly owned foreign enterprises and Chinese-foreign joint ventures have been set up and are generally doing well, their profits rate exceeding 85 percent. Over 400 products have made their way into the international marketplace.

Establishing an industry-based economy in the SEZ. There are now more than 750 industrial enterprises in the SEZ, compared to 224 in 1979, a better than 3-fold increase. Employment and total industrial output value have grown 7- and 29-fold respectively. Estimates put this year's industrial output value at 2.4 billion yuan, up 33 percent over 1984. Industry's internal structure has also undergone marked changes. Formerly dominated by processing with foreign materials and other labor-intensive operations, we now manufacture our own products and are gradually moving toward technology- and knowledge-intensive industries. More and more of our products, too, are now destined for the foreign market; from last January through September, the sale of industrial goods made in the SEZ generated 1.3 billion yuan, of which 43 percent were derived from exports. There is a tendency in the SEZ's industrial sector and product mix toward developing products which are "light, small, sophisticated and modern." In agriculture, we have put together preliminarily a production base of a respectable size for fresh produce. Agriculture is becoming commercialized, specialized and intensive. Substantial progress has also been made in commerce, foreign trade, transportation, finance, tourism, the restaurant business, culture, public health, education and so on.

The standard of living of the masses has gone up noticeably. In 1984 per capita income among peasants in the SEZ reached 1,700 yuan and over 80 percent of them have built new houses. The wages of industrial workers too have gone up. The establishment of the SEZ has checked the brain drain from Shenzhen; in fact, over 1,000 people have returned from Hong Kong and settled down in the zone.

Referring to the effects of the zone, Liang Xiang said, "Since its establishment, the SEZ has promoted the opening up of the coastal areas and begun to function as a 'window' and 'shining example,' providing some lessons for reform in the interior and turning out a batch of qualified people. It has also had a positive impact on Hong Kong and Taiwan."

Liang Xiang said, "Through our experience with the open door policy and reform, we are convinced we cannot equate that policy with susceptibility to corruption by capitalist ideas. As long as we do our work well and strengthen the party's leadership and the construction of the socialist spiritual civilization, we can transform negative factors into positive ones."

He said finally, "In every respect today, the zone has laid a good foundation. It is becoming more and more attractive to foreign investors. Shenzhen has a bright future."

## SPECIAL ECONOMIC ZONES

### LIGHT INDUSTRY BOOSTS EXPORTS IN NEW 5-YEAR PLAN

Beijing RENMIN RIBAO (OVERSEAS EDITION) in Chinese 29 Dec 85 p 3

[Article by Feng Xiao [7458 7197]: "Strong Growth in Light Industrial Exports in the 'Sixth 5-Year Plan']

[Text] During the "Sixth 5-Year Plan," Chinese light industrial exports have increased markedly, reaching a total value of \$6.72 billion, up 63.4 percent over the "Fifth 5-Year Plan," Liu Yan [0491 1484], general manager of the China National Light Industrial Products Import and Export Corporation [INDUSTRY] told reporters yesterday. In 1985, the industry earned \$1.3 billion in foreign exchange from export.

Under the "Sixth 5-Year Plan," the corporation devoted itself to nurturing the export commodity production points of 80 product lines, including shoes, toys, packaging, glassware, leather goods, plastic products and stainless still tableware, to ensure that export plans were fulfilled and lay a solid foundation for the construction of export commodity production bases.

General Manager Liu Yan said that systematic reforms in the corporation have begun to pay off. Its three subsidiary companies which handle import have registered with the State Industry and Commerce Administration and will go into business on 1 January 1986. They are the China National Home Appliance Import Co, China National Paper and Paper Pulp Import Co and China National Light Industrial Product Technical Service Import Co. They specialize in the import of different lines of products and the provision of post-import services. As legal persons, they follow independent accounting and have managerial autonomy.

In 1985, the corporation seized every opportunity it had and went all out to expand export. It took part in the Guanagzhou Trade Fair twice, held its own light industrial product export talks, organized joint sales missions overseas and shipped mail and phone orders promptly, thereby fulfilling its export targets. In the main, Chinese light industrial exports are destined for Hong Kong, Macao and the Third World. Over the past year, the corporation combined moves to consolidate existing markets with efforts to open up those in Japan, the U.S. and Western Europe. Our exports to Japan and the U.S. in such key



categories as shoes, leather, sporting goods, office supplies and toys have all increased substantially. In 1985 we sold over \$30 million worth of shoes to those two countries and \$5 million worth of fabric toys to the United States.

The cost of exports dropped last year compared to 1984 and was the lowest ever in history.

12581  
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## LABOR AND WAGES

### STATUS OF WORKERS IN JOINT VENTURE ENTERPRISES EMPHASIZED

Beijing GONGREN RIBAO in Chinese 23 Oct 85 p 3

[Article by Beijing Jeep Plant Trade Union: "No Change In Position of Staff Members and Workers Being Masters In Their Own House in Joint Venture Enterprises"]

[Text] As the Party's policy of enlivening the domestic economy and opening the door to the outside world becomes more pervasive, some Chinese and foreign joint venture and cooperative enterprises as well as enterprises solely capitalized by foreign traders have been set up in China's special economic zones, in coastal cities and inland. They have brought new vitality to China's economic construction while occasioning numerous new problems at the same time. Whether or not staff members and workers in these enterprises remain masters in their own house has raised doubts in the minds of some.

Correct handling of this issue requires, first of all, an understanding of the nature of these kinds of enterprises. Chinese and foreign joint venture enterprises have been established under the socialist system to meet real needs in China's modernization. China has shares in them; they are under jurisdiction of China's laws; they are subject to Chinese government leaders, and are jointly run, in fact. They are a special form of economic organization among China's diversified socialist forms of economic organization. In accordance with Lenin's thesis that "State capitalism is capitalism that we are able to control and whose field of activity we are able to decide," Chinese and foreign joint venture enterprises are in the category of state capitalism and thus their character is determined by this.

Staff members and workers in joint venture enterprises must realize, first of all, that no change has taken place in their position as masters in their own country, and that they are still masters of the country and masters of the enterprise. This is determined by our socialist character. Staff members and workers in joint venture enterprises are simultaneously employees of the enterprise, and this is determined by the character of the national capitalist character of joint enterprises. However, staff members in joint venture enterprises are not commodities to be bought and sold freely as in capitalist societies. China has a series of laws to guarantee the democratic rights and the material benefits of staff members and workers.

A look at means of production relationships and distribution relationships shows joint venture enterprises to be a combination of socialist public ownership and capitalist private ownership in which the socialist economic component is frequently greater than the capitalist economic component. This proportional relationship of the means of production determines the common sharing of products by both parties. Means of production relationships and corresponding distribution relationships are the main basis for judging the character of any given economic form.

2. A look at the goals of production shows that that joint venture enterprises serve socialism under guidance of state plan. The goals of both parties to the operation of a joint venture enterprise are by no means the same. The goal of foreign traders is to make a fair profit, while China's goal is to use the favorable conditions created as a result of the use of joint ventures to hasten the building of the nation's economy and to improve the material standard of living of the people. This production goal is completely synonymous with that of the country's state-owned enterprises.

3. Looked at in terms of development, joint venture enterprises are considerably stable; however, they do not represent by any means the fundamental direction of development of socialist enterprises. Once the period of joint operations is up and after China has bought out the foreign party's shares, the joint venture enterprise reverts to Chinese ownership in entirety, and it becomes an enterprise under socialist public ownership. China's staff members and workers have all the political rights conferred by the socialist national constitution and laws. This differs fundamentally from the political position of workers in capitalist countries.

4. Joint venture enterprises must engage in production and business activities under jurisdiction of Chinese laws in accordance with provisions of the "Joint Venture Enterprises Law." The sovereignty that China exercises is also an expression in concentrated form of the authority of the people, i.e., of every staff member and worker.

To summarize the foregoing, fundamentally speaking, no change has taken place in the position of staff members and workers employed in Chinese and foreign joint venture enterprises being masters in their own house. Therefore, staff members and workers who work in these enterprises should do their work boldly and assuredly with the bearing of masters in their own house, correctly understand and carry out the Party's open door policy and constantly explore and summarize experiences, doing a good job in the joint venture enterprises.

9432

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## LABOR AND WAGES

### NEED TO DEVELOP EXPORT OF LABOR CITED

Wuhan HUBEI RIBAO in Chinese 13 Oct 85 p 2

[Article by He Jinkai [0149 6855 7030]: "Development of Labor Resources Is Imperative"

[Text] Ample labor resources is a major strength of Hubei Province. A survey shows that despite the opening of a series of broad employment avenues in cities and the countryside and the placement of large numbers of the workforce during the past 2 years, the amount of surplus rural labor remains considerable at the present time. Enterprises are also universally overstaffed. Surplus labor figured at 12 percent for the province as a whole means 3 million people. Clearly, potential is great.

How can this potential be converted into wealth? One important way is to organize the export of labor.

The export of labor referred to here includes both export to foreign countries and to other counties, provinces and cities. In 1984, Zhongxiang County exported 11,000 workers and 20 million yuan flowed back into the county. The political research unit in the Hubei Provincial CPC Committee believed that this same county can now export 50,000 people annually who will send back 100 million yuan in earnings, which is equal to a net increase of 500,000 dan of cotton or 600 million jin of grain!

Statistics show that the province's export of labor to other provinces or to foreign countries totaled only a little more than 15,000 people, or only 1 percent of the province's total surplus labor. Of greatest importance at the moment in increasing exports of labor is heightened awareness and improved organizational leadership. It is necessary, first of all, to straighten out the muddled thinking that places today's export of working personnel on the same level with the "Chinese labor" of the old society. A comrade engaged in foreign aid work told the correspondent that "Chinese labor" was the product of special historical conditions. Today when Chinese go outside the country to work, first of all they have the backing of a powerful socialist motherland that is much more respected internationally. Second, personnel going abroad have all the rights they enjoy in China properly respected. Materially, their treatment is of the best, and politically the people regard them as foreign emissaries who may return to their homeland as agreed upon completion of their

mission. Yet another important matter is the need to set up needed labor export service organizations responsible for organizing the export of labor, transmitting information, bettering the education and management of exported labor and helping allay the apprehensions of the families of those who depart.

A political economics teacher believes that export of labor is not only of very great economic significance, but is a social university for upgrading the quality of peasants. He said that letting the peasants get a broad view of the vast commodity economy world will help improve skills for development of a commodity economy.

9432

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## TRANSPORTATION

### STATUS OF IMPROVED SHANGHAI-NANJING RAILROAD OUTLINED

Beijing TIEDAO ZHISHI [RAILWAY KNOWLEDGE] in Chinese No 6, 28 Nov 85 pp 4-5

[Article by Xue Guibao [5641 6311 1405]: "The Shanghai-Nanjing Railway"]

[Text] The beautiful and richly endowed Chang Jiang Delta, which the Chinese government has designated an open economic zone, contains abundant resources, a dense population, extremely well developed industry and agriculture, and is the area of the country with highest economic effectiveness. On this golden tract of land run three railroads: the Tianjin-Pukou, the Nanjing-Wuxi and the Shanghai-Hangzhou lines that connect the five large cities of Shanghai, Suzhou, Wuxi, Changzhou, Zhenjiang and Nanjing, plus a trunkline that connects the Chang Jiang with the Grand Canal. This is the 77 year old Shanghai-Nanjing Railroad that has become the busiest transportation artery in east China.

Construction of the Shanghai-Nanjing Railroad began in 1908. It is 311 kilometers long and was constructed with British funds. It was the railroad for which the squandering of funds was most serious among all of China's railroad construction projects. Despite the high construction costs, the equipment was extremely antiquated. Most of the technology used was out of date and the railroad used a welter of small locomotives, small passenger cars, small rails, and small telephones. Transportation efficiency was extremely low. It lost money every year in the 41 years of its operation. Right up until the eve of liberation, it was in the peculiar situation of deriving more income from hauling passengers than from freight. Following liberation, as the People's Government revived transportation and improved efficiency, it steadily increased investment in railroads and carried out a planned technical transformation that very greatly improved the locomotives, railroad cars, stations, tracks, and signaling equipment on the Shanghai-Nanjing line. The former ramshackle equipment was largely replaced with new equipment of superior quality and high efficiency that cost less to operate. Today, the amount of passenger and freight traffic handled by the Shanghai-Nanjing Railroad is six times that of the old Shanghai-Nanjing Railroad (1949).



## Powered With Diesel Locomotives

Locomotives provide the power for railroad transportation, and they are the crux in improvement of transportation efficiency. Up until liberation, locomotives used on the Shanghai-Nanjing Railroad were mostly SL, PX, and MK models of small steam locomotives of low horsepower and low pulling power. Furthermore, all these locomotives had been bought abroad, so it was difficult to get spare parts for them and frequently half of them were "laid up." Tonnage pulled per locomotive was very low at that time, only 1,740 tons being hauled. The main criterion for judging locomotive efficiency is locomotive output per day. At that time, this was only 85,000 ton kilometers for the Shanghai-Nanjing Railroad. Locomotive maintenance and repair equipment was also very antiquated. When it was built in 1907, the Longtou roundhouse in Nanjing at the northern end of the Shanghai-Nanjing Railroad had only one temporary locomotive repair shed. It was not until 1935 that a chassis repair shop was built for the repair of passenger cars as well as locomotives. Today the Nanjing East diesel maintenance section replaces the Longtou roundhouse in Nanjing. This maintenance section is huge. It occupies 400 mu of land and is 1.8 kilometers long, the line totaling 1,868 meters. It has three buildings for chassis repairs, wheel repairs and all other work, these buildings covering a 19,372 square meter area. Because the Nanjing East maintenance section has advanced equipment and much skilled labor, its repair efficiency is very high. Take 1981, for example, when it repaired 25 locomotive chassis and 269 locomotive wheels. This section has a large number of Chinese produced Dongfeng diesel locomotives and Romanian made ND 2 diesel locomotives. In September 1985, it will begin to use China's first imports of American produced ND 5 high performance diesels to replace existing diesels. Today all passenger locomotives on the Shanghai-Nanjing Railroad are diesels, and half the freight locomotives are diesels. After the transition from steam to diesel locomotives, locomotive freight tonnage hauled on the Shanghai-Nanjing Railroad rose from the 1,740 tons before liberation to 3,500 tons, and output per day rose from 85,000 ton kilometers per locomotive to 1,119,000 ton kilometers. Cars have also been replaced.

## Expansion and New Construction of Railroad Stations

The Shanghai-Nanjing Railroad has always been extremely busy with the hauling of passengers. Take the Shanghai station, for example, which dispatched 30,000 passengers daily during the 1960's, During the 1970's, the number increased to more than 50,000, and during the 1980's, it spurted to between 80,000 and 90,000, with a maximum of 140,000 per day. During the lunar New Year and during the peak travel season, Suzhou Station handles more than 56,000 passengers. Ordinarily the number is also 30,000 to 40,000 per day.

The railroad stations at Shanghai and Suzhou were built in 1906, however. They are cramped and old, and a long way from being able to meet increasingly busy transportation needs. Despite constant improvements since liberation, congestion remains in the purchase of tickets and waiting for trains. In order to deal with this problem, in 1981 the State Council formally approved the building of a new Shanghai passenger station. The new Shanghai station will be an elevated structure that spans the station tracks. Above the station platform will be 16 waiting rooms that total 13,000 square meters in area. The

new passenger station will have a total of 17 sidings and seven station platforms; it will have a design capacity for 72 arriving and departing trains daily and a maximum gathering of 10,000 people. After the new Shanghai station has been built, it will become the country's first elevated railroad station that spans the tracks, and it will also be the largest passenger station on the Shanghai-Nanjing Railroad.

In 1982, a new railroad station was built in Suzhou, which is rich in local character. The new station has the air of classical structures. Its roof has upturned eaves and is covered with tea green tiles, which make it fit in harmoniously with Suzhou City. The inside of the Suzhou station has landscapes, pools with rockery and winding courtyards. It deserves to be called a "garden window" on the Shanghai-Nanjing line.

#### Lengthening of Railroad Line Track

Rail lines are the foundation on which trains travel. Up until liberation, the Shanghai-Nanjing Railroad was a single track line and the line's equipment was not in good shape. On many sections, the road bed was not wide enough and ballast was insufficient everywhere. Sleepers were badly rotted. The biggest problem was the tracks, all of which were light rails of a variety of makes and as many as 53 models. The rails were also very seriously worn, and there were neither filler plates nor anti-creepers anywhere under the tracks. Because of the poor quality of the line and its many faults, train speeds were limited. Maximum train speed was no more than 75 kilometers per hour.

After liberation, the first task was major overhaul of the line, sifting and hardening of road beds, filling in places lacking ballast with stones, replacement of completely defective sleepers, and installation of track filler plates and anti-creepers. Next, most wooden sleepers were replaced with steel-reinforced concrete sleepers and concrete slab sleepers. Small, joined together, hand operated switches were replaced with large manganese steel automatic switches, which increased the line's smoothness. During the 1960's, the Shanghai-Nanjing Railroad got rid of its light mixed makes of rails replacing them with heavy steel rails weighing 50 kilograms per meter. In 1969, the Shanghai-Nanjing Railroad began to use the new technology of welding together tracks in long sections, welding short 12.5 meter long sections of track into long track sections approximately 1,000 meters long to develop the Shanghai-Nanjing Railroad in the direction of becoming a seamless line. Not only did this reduce wear and tear on cars and increase train speeds, but it also greatly reduced noise inside passenger cars for an improvement of conditions for passengers. Now the Shanghai-Nanjing Railroad's main line is 618 kilometers long, 361 kilometers or 58 percent of which is seamless. In 1978 double tracking of the Shanghai-Nanjing Railroad was completed. This transformed the Shanghai-Nanjing trunkline from the pre-liberation single line to a completely doubletracked line, and virtually all of the line consisted of long tracks. Effective length of train station sidings was extended from the 650 meters prior to liberation to the present 1,050 meters. Rise in quality of the line increased train carrying capacity. Before liberation, 27 trains per day traveled the line. Today, 162 trains travel the line in both directions, and the permissible train speed has also increased from 75 kilometers per hour to 120 kilometers per hour.

Signals are the ears and eyes of railroad communications. Before liberation and during the early 1950's, communications and the number of signals on the Shanghai-Nanjing Railroad were in a backward state. Most stations used hand operated semaphore signals, and at night it was necessary to climb up the signaling machines and hang a lantern on them. Either signs along the track or train staff were used to block trains. Most line switches used mechanical junction boxes for signal junctions, and some stations even used hand signals to guide the coupling of cars. Train safety was uncertain and train speeds were also limited. In the mid-1960's, semaphore signaling machines began to be replaced with colored light signaling machines, and electric relay semi-automatic blocking eliminated the mechanical junction boxes. Today, modern automatic blocking has been installed all along the Shanghai-Nanjing Railroad and all signaling machine displays are automatically controlled by electrical equipment. Not only does this insure operating safety, but it also increase one or two fold the number of trains able to travel between one area and another.

#### Automation of Communications Equipment

During the period immediately following liberation, communications equipment along the Shanghai-Nanjing Railroad was extremely outdated. Old magnetic telephones were used, and they were frightfully few in number. There was only a three-channel carrier between Shanghai and Nanjing, and there was no direct line between Nanjing and Beijing. During the 1960's, common-battery telephones were installed at all major stations along the line. The number of telephones in the section between Nanjing and Changzhou alone numbered 800, which was a fourfold increase over the number during the period immediately following liberation. There was a 12 channel carrier between Shanghai and Nanjing, and a long distance carrier telephone was opened between Nanjing and Beijing. Between Nanjing and Zhenjiang is a short-range carrier telephone. To meet the situation resulting from the opening to railroad traffic of the Chang Jiang bridge at Nanjing and from the Nanjing East classification station, in 1968 Nanjing Prefecture put into operation a 1,000 line automatic telephone exchange thereby completely automating telephones in the Nanjing hub. With the development of semiconductor technology, large scale use was also made of 12 channel semiconductors and three-channel carriers for long-distance communications on the Shanghai-Nanjing line. Opening of carrier return lines reached the apex of power line design, and automatic dialing could be done between Shanghai and Nanjing. With completion of the doubletracking of the Shanghai-Nanjing Railroad during the 1980's and the laying of small co-axial cable, communications improved greatly again. In Nanjing Prefecture alone, the number of telephones increased to 2,200, or an average of 1 telephone per 15 people, and automatic dialing was installed between Nanjing and Changzhou, Danyang, Zhenjiang and Longtan as well as between Shanghai and Suzhou, Wuxi and Nanxiang. A new communications hub for east China railroads with a 3,000 line automatic exchange is being built in Nanjing Prefecture. A 1,000 line automatic telephone exchange is being constructed for the Nanjing East classification station, and a 300 channel small co-axial cable improvement project between Shanghai and Nanjing is underway. The Shanghai-Nanjing

Railroad is in process of building a communications network with many circuits, many channels, and many techniques that is transistorized, miniaturized and automated.

Doubletracking of the Shanghai-Nanjing Railroad and the opening of the Chang Jiang Bridge at Nanjing to railroad traffic laid the foundation for development of both passenger and freight transportation. Before liberation, passenger trains could travel only on the Shanghai-Nanjing line itself; they could not cross over to other lines. Long distance passengers had to repurchase tickets and reboard other trains at either Nanjing or Shanghai. Today trains starting out in Shanghai can go all the way to Guangzhou, Qiqihaer or Wulumuqi.

In the more than 30 years since liberation, the Shanghai Railroad Bureau has not stinted on technical improvements to the Shanghai-Nanjing Railroad. It has used every available means to tap the line's potential to the full, thereby increasing many times over the passenger and freight carried by the Shanghai-Nanjing Railroad. The number of passengers has increased by 4 percent per year; the amount of freight carried has increased by 5.5 percent per year; and earnings from transportation have increased 12.4 percent per year. Today the Shanghai-Nanjing Railroad has become a major trunk line in the national railway network with advanced equipment and remarkable economic effectiveness.

3432

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## TRANSPORTATION

### BACKGROUND PROVIDED ON BEIJING-TAIYUAN RAILWAY

Beijing TIEDAO ZHISHI [RAILWAY KNOWLEDGE] in Chinese No 4, 28 Jul 85 pp 6-7

[Article by Liu Tongwei [0491 4827 3956]: "The Opening of a Coal Hauling Route in the Early 1970's---the Beijing-Taiyuan Railway"]

[Text] During the early 1970's, a railroad trunk line was built to connect the capital directly with Shanxi Province. This trunk line began at the Shijingshan south station at the Beijing hub and traversed Lianggezhuang, Baijian, Zijingguan, and Futugu. It crossed the Wutai mountain region and went through Pingxingguan, Yanmenguan, and Zaolin connecting with the line running from Datong to Fengling Ferry at the Yuanping station in northern Shanxi. This line was dubbed the Beijing-Taiyuan Railroad. During the past 10 years and more, this railroad has played a very important role in the hauling of coal out of Shanxi Province, to become a major coal hauling route.

### Opening of Additional Coal Hauling Routes

As early as the 1950's, the state placed the exploitation of Shanxi's natural resources on its important daily agenda for development of the national economy. Shanxi has various underground resources including coal, iron, copper and bauxite. Coal reserves, in particular, amount to one third of the country's total, and more than two-thirds of the counties in the province have coal fields. Furthermore, coal is of all kinds and quality is outstanding. It has superior quality coal for power and it has coking coal. In northeast Shanxi, along the line running northward from Datong to Fengling Ferry, there are numerous open pit coal mines in which mining conditions are good, reserves large, and costs low. Annual output reaches several million tons most of which has to be hauled elsewhere.

During the period immediately following liberation, except for the Datong to Fengling Railroad and the Shijiazhuang to Taiyuan Railroad in the south, there was only the Beijing to Baotou Railroad in the north as routes for hauling coal out of Shanxi Province. Capacity for hauling coal was extremely inadequate. After the Fengtai-Shahe line had been built, capacity was still inadequate to meet needs. For this reason, the decision was made to build the Beijing to Taiyuan Railroad to add a route for hauling coal.



In addition to hauling coal, the Beijing-Taiyuan Railroad also plays an important role in the exploitation and transportation of local natural resources. The line meanders through the Wutai mountain region and the Taihang range, paralleling or cutting across the Hutuo He, the Tang He, the Juma He, the Dashi He, and the Yongding He. Products are abundant along the line, and underground resources are in process of being exploited. One example is the iron mine in the Wutai mountain region where mining began during the end of the 1950's with several hundred thousand tons being carried away annually. Some of the deposits of copper, bauxite, manganese, and clay have been exploited, and preparations are underway to exploit others. More than 20 feeder railroad lines have been built in this area.

Farm and livestock products are also very abundant in the more than 10 counties through which this line passes. Farm products include millet, corn, potatoes, soybeans and gaoliang. In the Wutai mountain region, one crop per year of naked barley, flax and sugarbeets are harvested, the quality of which is good and the output of which is high. In the animal husbandry field, both in the Wutai mountain region and the Taihang mountain region have fine natural pasturelands where the raising of cattle, sheep and goats, horses, donkeys and mules is extremely well developed. Some of the beef and mutton eaten in the Beijing-Tianjin-Tangshan area is supply from here.

#### Relatively High Standard Mountain Region Railroad

Standards were generally not high for mountain region railroads built right after liberation. Most were second or third rate railroads, and some were built like branch lines. Because it was part of a network and also because it had a big job to do, the Beijing-Taiyuan Railroad was built to relatively high technical standards. It was built as a single track first rate trunk line. Grade was limited to .06 percent (a .12 percent grade in western Pingxingguan). Minimum curve radius was 600 meters; and effective length of the daofa [0451 4099] line was 650 meters; allowance [yuliu - 7315 3966]; at the time of tunnel construction, overhead clearance was allowed for future electrification of the line. "East is Red" diesel locomotives were used to pull trains. Initial transportation capacity was set at 5 million tons, with 10 million tons intended over the long range.

Along the Beijing-Taiyuan railroad line, mountains are high and valleys deep; streams contain rapids; mountains are craggy, rock cracking is well developed, and the geological structure is complex being made up of limestone, gneiss, granite and schist, for the most part, with some new and old loessal soil, sand clay and alluvial pebble layers. Engineering is extremely daunting. Earthquake fissuring is between 6 and 8 degrees, and this has substantial effect on the structure of projects and handling of road beds. The western section of the line parallels the Hutuo He, and in the eastern section, it crosses the Juma He at 10 places at large faults at Dayaobo, Wangjiagou, Gushan, Yuncailing, Zhaobo, Futugu, Zijingguan, Erdao He and Babao Shan. An especially large bridge is located atop the Yongding He fault. The tunnel at Xishankou goes through a coal vein, and beneath the large bridge at Lianggezhuang is a karst cave. Beneath the tunnels at Pingxingguan and Duomaling is a heavy rush of water. All these things increased the complexity of the project.



The Beijing-Taiyuan Railroad is 418 kilometers long. It has 41 stations, 12 tunnels and 216 bridges. Bridges and tunnels have a combined length of 105 kilometers, or one-fourth the length of the entire line. Nearly 30 million cubic meters of material were moved to build the road bed. Work began in October 1958, and by October 1960 the first 60 kilometer section of the line between Yuanping and Zaolin had been built. Construction was temporarily halted at that time due to a general retrenchment of capital construction. Construction recommenced in 1965, first on the eastern end and then in the west, section by section. By October 1971, the entire line was opened to traffic. At the end of 1972, the line was turned over for operation.

#### Daunting Tunnel Projects

The Beijing-Taiyuan Railroad is noted for its numerous and long tunnels. The 120 tunnels along the line total 87 kilometers in length. There is an average of one tunnel every 3.48 kilometers, and there are 26 tunnels that are more than 1 kilometer long. At the border between Hebei and Shanxi provinces, the railroad has to go through the Duoma mountain range at 1,600 meters above sea level. The longest tunnel on the line is located here---the Duomaling Tunnel that is 7,032 meters long and at a maximum depth of 500 meters. The tunnel goes through Ordovician limestone strata where there is a fault fracture zone and an ancient river bed containing intercalated sandstone pebble illuvial stratum. It goes through a more than 30 meter deep fault vein and more than 20 karst caves. Maximum ground water flow reaches 6 tons per day and night. There were more than 60 landslides during construction.

The Duomaling Tunnel is one of the major control projects on the whole line. The troop units responsible for construction of the railroad used the technique of "dividing long tunnels into short sections." They excavated numerous short caves using more than 60 construction machines that worked to make parallel excavations ahead that increased the work face. They used high speed excavation to speed up construction progress, required only 24 months to complete the main tunnel project.

The Beijing-Taiyuan Railroad goes through many mountain passes such as Dongyusi, Baijian, Zijingguan, Wang'anzhen, Pingxingguan, and Yanmenguan. There are very many tunnels that follow one after another in some stretches. In only a 1.1 kilometer stretch between Baijian Bridge and Juma He Bridge, for example, there are four tunnels totaling 469 meters in length that are known as the Baijian tunnel group. The terrain is precipitous along this section of the line making construction extremely difficult. The construction units used the technique of "digging a group of tunnels together." First they assembled troops for simultaneous opening of two tunnels followed by the opening of another two tunnels for fastest progress in construction. It took them only 8 months to complete the boring of this group of tunnels.

#### Mechanized Laying of Rows of Tracks

Track laying is an important procedure in railroad construction. The former method of laying track had generally been to have human labor arrange sleepers on the road bed followed by the placement, one by one on the sleepers, of

steel sleepers and spiking them down. This was slow; efficiency was low; labor was highly intensive and it was difficult to assure quality.

In modern railroad construction, track laying operations have been mechanized. This means the operation of track assembly yards at specific points along the line. In these yards, row after row of tracks are arranged in fixed positions in accordance with set technical specifications to form long ladder-like structures, one after another. This method is termed "track assembly production." When the tracks are laid, the assembled tracks are loaded to a track layer and transported to places along the line where they are unloaded on the road bed. This greatly increases efficiency and quality and hastens track laying.

Track assembly production on the Beijing-Taiyuan line is centralized at the assembly yards at Shijingshan south station, at Baijian, and at Wutai. Production of track assemblies involves anchoring, spacing of sleepers, matching of tracks, putting on attaching hardware, tightening bolts, inspection and loading on to railroad cars. It is done as an assembly line operation. After the tracks have been assembled, they are stacked up in piles in the yards from which they may be transported to be laid along the line at any time. Each track assembly yard can manufacture between 48 and 60 track assemblies daily, sufficient to the laying of between 1.2 and 1.3 kilometers of railroad line.

#### The Alluring Scenery Along the Line

The Beijing-Taiyuan Railroad goes through the Taihang Shan and Wutai Shan mountain regions and the southern foothills of the Heng Shan. Mountains and rivers crisscross the line; the topography is difficult of access; the scenery is singular, and there are numerous famous historical sites that are rather alluring. A train passing through Shijingshan south station and going to Shidu Station passes through a scenic area. Here verdant peaks rise one after another and streams flow along slowly. This area is noted for having the Guilin scenery of north China. The train travels westward to Zij'ngguan, which is a famous historical site. Here the sheer cliffs stand like walls, and this is the area of the seventh trail of the "Taihang Eight Trails." In mid-summer, it is possible to see Chinese redbud all over the mountainland and to enjoy magnificent and beautiful view of the Great Wall. Farther westward at Laiyuan, one can see Chanlin Temple built during the Liao Dynasty. Continuing onward to Pingxingguan, one comes to a site where large numbers of Japanese troops were annihilated during the Pingxingguan campaign during the early period of the War of Resistance to Japan. Here there are range after range of mountain peaks, deep valleys with streams, dark green pine and cedar trees, and the battlefield of a former day has become a tourist site. In addition, here in Dai County stands the Yang family memorial temple to the five generals of the Yang family of the Northern Song Dynasty and Yanmenguan, which is "the most strategic point." The construction and the statues in Huiji Temple in Yuanping County have the flavor of the Song Dynasty. All these places are ancient historical sites.

It is Wutai Shan, however, that is the most noted tourist area along the Beijing-Taiyuan Railroad. Wutai Shan is located in the southeastern part of

Fanshi County, and it is one of the four most famous Buddhist mountains in China. The view from atop the mountain is magnificent and beautiful; the climate is cool and crisp making it a good summer vacation spot. The mountain is thick with temples, many of them concentrated in Taihuai Village. During the historical period when temples were most numerous, there were more than 200 of them here. Today more than 40 survive. The buildings are magnificent; the carvings are exquisite, and painted statues are found in every temple. The Shell great white dagoba, Xiantong Temple, Shuxiang Temple, Boddhisatva Mountaintop, Jinge Temple, Nanshan Temple, and Zhenhai Temple are all famous temples here. Xiantong Temple is the largest of all of them. Inside the temple is a copper hall that contains 10,000 small Buddhist castings and characters made from flowers and plants, the modeling of which is exquisite and which are unique and beautiful.

Once trains began to run over the Beijing-Taiyuan line in 1972, not only did they provide a convenience for travelers, but they also promoted development along the line. The volume of transportation has grown steadily, cargo transported amounting to more than 5 million tons annually, which is already larger than the originally designed capacity. More than 1 million passengers also travel this line, making trains fairly crowded.

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## TRANSPORTATION

### BEIJING-TONGLIAO RAILROAD EVALUATED

Beijing TIEDAO ZHISHI [RAILWAY KNOWLEDGE] in Chinese No 4, 28 Jul 85 pp 8-9

[Article by Chen Yuanmou [7115 6678 (180): "The Second Transportation Trunkline to Connect Places Inside and Outside the Great Wall---the Beijing-Tongliao Railroad"]]

[Text] Five years have passed since the Beijing-Tongliao Railroad was built and turned over for operations. But whenever this railroad is mentioned, some people seem unfamiliar with it. This is a railroad that starts out in Beijing, parallels the Beijing-Shenyang Railroad, and crosses the newly built industrial cities of Zhelimu League in the Nei Monggol Autonomous Region ending at Tongliao. It is the the second transportation trunkline to connect places inside and outside the Great Wall.

The Beijing-Tongliao Railroad starts at Changping in suburban Beijing, goes through Luanping, Longhua, and Weichang counties in Hebei Province, goes through Chifeng in Zhaozuda League and Naiman in Zhelimu League in the Nei Monggol Autonomous Region and on to Tongliao for a distance totaling 805.77 kilometers. Work began all along this line in August 1972, and by 4 December 1977 all track had been connected and the line opened to traffic. On 1 May 1980, construction of associated facilities was completed and the line was turned over for operation. The division of freight between this line and the Beijing-Shenyang Railroad has greatly eased congestion on the old transportation line.

### A Daunting Engineering Project That Goes Through Yan Shan and Across Sand Dunes

The western section of the Beijing-Tongliao Railroad snakes through the southern foothills of Yan Shan. The 171 kilometer section that runs from Heishui Shan to Longhua traverses the Yanshan hinterland where the topography is precipitous, is crisscrossed with ravines, and where faults interlock making the geology complex and requiring a succession of bridges and tunnels. The project was an extremely arduous one. To the east of Chifeng the terrain is flat; however, the railroad line traverses shifting sand dunes so projects to ward off and stabilize the sand were numerous. The road bed for the entire line required a total of 66.72 million cubic meters of earth and stone. The line has 116 tunnels totaling 77.97 kilometers in length. This includes a

total of 11 tunnels, each more than 2 kilometers long for a total length of 31.92 kilometers. The Red Flag Tunnel that goes through the watershed between the Luan He and the Yisun He is 5,848 meters long, the longest tunnel on the whole line. Troops were assembled for the construction, which took 23 months, the construction proceeding at an average total of 254.3 meters per month from both ends of the tunnel. A swarm of tunnels was built at the Gubeikou, Hushikou and Miaogong sections. In the 10 kilometers between Hushikou and Gangzi, there are 16 tunnels with a total length of 3,860 meters. At places where the railroad crosses the Chaobai He, the Luan He and the Daliao He water systems, 450 bridges totaling 44.75 kilometers in length were built. This included 14 especially large bridges 500 meters or more long totaling 10.74 kilometers in length. The 1,447 meter especially long Laoha He Bridge is the largest bridge in northeast China today. The Baihe Bridge at the entrance to the Miyun Reservoir is 402 meters long and is the most complex steel truss bridge with a deep water foundation on the whole line. During construction, the water was 24 meters deep, and the open caisson steel bridge piers were sunk 22 meters into the river bed. The whole bridge contains 22,000 cubic meters of masonry and 385 meters of steel trussing weighing 1,987 tons. In the area around Sheliu in Naiman Banner on the southern fringe of the Keerqin Desert is located the country's third largest shifting sand dunes. Tall and low sand dunes undulate across the landscape. In each windy season, when the wind howls, the sands shift destroying structures on the surface of the land. The railroad has to go through 30 kilometers of shifting sand dunes and 130 kilometers of shifting sandy flatlands. To bring the yellow sand under control and prevent sand damage to the line, large shelter projects were built. The most important such projects were the laying of 200,000 cubic meters of crushed stone, the spreading of 20 million jin of tree boughs to stop the sand, and the afforestation of more than 24,600 mu to stabilize the sand. Now trees stand in profusion on both sides of the railroad like a green Great Wall in the middle of a boundless sea of sand. They effectively lock out the creeping sand and protect the line, keeping it open and free from obstacles.

#### Through the Great Wall and Across The Hunting Grounds With Magnificent Scenery

As the Beijing-Tongliao Railroad meanders around inside and outside the Great Wall, it passes through majestically serene scenery and numerous famous historical sites. The railroad goes from Changping Station northeastward past the Ming Tombs Reservoir Dam and the north shore of Miyun Reservoir and flies across 15 large bridges for a stretch of more than 30 kilometers. Passengers aboard the train can enjoy to the full the beautiful lake-like appearance of the reservoirs. From the Gubeikou railroad station at the Great Wall, they can look westward from the station platform where they will see only a series of peaks, each one rising higher than the other and the magnificent Great Wall meandering and twisting across craggy mountain ranges. Gubeikou is the major route for going from Beijing to the area beyond the Great Wall, and it has historically been a strategic military pass. At the passage through the Great Wall, there are three or four roads leading inside and outside the wall and towers rise up around to guard the area. The imposing view surpasses the views at Juyongguan and Badaling. The railroad heads from Jinshanling at the foot of the Great Wall to the ancient city of Longhua outside beyond the Great Wall. Here beneath Taishan lies the cemetery of the honored martyr, Dong Cunrui. This is the place where the famed combat hero Dong Cunrui courageously



sacrificed his life in the cause of the Liberation Army on 25 May 1948 to blow up a pillbox in the liberation of Longhua. In Weichang County, the railroad crosses the Mulan Hunting Ground where the Qing Dynasty emperors conducted military and political activities "practicing military arts to pacify distant places." Historical records show that in 1681, to maintain the riding and shooting traditions of the Manchu and Mongol forces and to solidify the unity of multiple nationalities, the Kangxi emperor personally led a group of Manchu and Mongolian cavalry troops on a reconnaissance of the landscape beyond the Great Wall where they discovered a valley set below high mountains with dense forests, which was a haunt of wild animals. It was an extremely fine natural hunting ground, which was given the name Mulan Hunting Grounds (in Manchu, mulan means places for sighting deer). For more than 140 years beginning from the 25th year of the Kangxi reign, the Qing emperors regularly traveled to the north to conduct their "annual autumn hunting ceremony." Today on both slopes along the railroad at Yisun Pass stand a stele with characters in the handwriting of the Qianlong emperor that reads, "Matters to be attended to at Yaokou," and a stele in Chinese characters in the hand of the Jiaqing emperor that reads "Account of Mulan." In a pine forest tract near the Miaogong Railroad Station stands a serene ancient Donggong temple. The splendid landscape and the hunting ground with its numerous historical sites attracts both Chinese and foreign sightseers.

#### Promotion of the Unity of Nationalities and Economic Development

Between the origin of the Beijing-Tongliao Railroad and its intersection with the Beijing-Baotou Railroad, it crosses the Chengde-Longhua and the Chifeng-Boshou branch lines, which are interlinked with the Beijing-Chengde and the Jinzhou-Chengde railroads. At its terminus, it connects with the Hushan-Jiatun Railroad and the Tongliao-Linhe Railroad to become an important integral part of the north China and northeast China regional railroad network.

Construction of this railroad line opened a railroad transportation route running directly from Hohhot in the Nei Monggol Autonomous Region to Hailaer in Hulunbeier League. The direct connection between the capital of the autonomous region with the three eastern leagues made closer the friendly intercourse among the various nationalities throughout the region, and increased unity among the nationalities. In addition, it played an active role in promoting economic development in mountain regions, sandy wastes, cities and villages along the railroad line.

Because of poor transportation in Luanping County deep in the Yan Shan, it had formerly been impossible to develop and use the mountain region's natural resources and native products. After the opening of the Beijing-Tongliao Railroad, large scale exploitation began of the county's 5 million tons of quartz reserves, large quantities of the rock being shipped by rail to Beijing and exported abroad. The mountain region is covered with rocks and sand, which were also hauled by rail to Beijing and Tianjin for use as construction materials. Even the stalks of hybrid gaoliang, which had formerly been used as fuel, were also hauled by the tons to places such as Qinhuangdao to be used as raw materials for making paper. The cash income of the masses increased correspondingly. The people said happily, "There are treasures everywhere in the mountains, but if they cannot be transported out, they are like trash."



Before liberation, there was a popular saying in Naiman Banner in Zhelimu League that went, "When the yellow dragons of sand churn and the sand dunes moves, walking along with a load on one's back is like carrying lead, but a single measure of grain carried over a great distance can be exchanged for only one-tenth as much salt. Nine out of every 10 people who leave never return." Following liberation, a 166 kilometer long highway was built to Tongliao. This made it easier to travel; however, the highway was frequently blocked by shifting sand dunes making movement impossible. The Beijing-Tongliao Railroad runs 123 kilometers through 12 villages and small towns throughout the banner. During the past several years, the Banner CPC Committee has built a total of nine roads leading to the railroad trunk line that pass through 29 villages and small towns in the banner, so vehicles can move a distance of more than 630 kilometers. Today, the fine wool that is produced in Naiman from superior breed Aohan sheep, and the famed red oxen, large red-tailed carp, Chinese ephedra [*Ephedra sinica*], and sand for making glass, that are special products of the region, are carried by railroad everywhere in the motherland, and some are even sold in distant foreign markets.

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## TRANSPORTATION

### NORTH XINJIANG RAILROAD CONSTRUCTION UNDERWAY

Beijing TIEDAO ZHISHI [RAILWAY KNOWLEDGE] in Chinese No 6, 28 Nov 85 pp 6-7

[Article by Wang Mingkui [3769 2494 1145]: "An Important Trunkline Serving the Northwestern Part of the Country---The North Xinjiang Railroad"]

[Text] The lofty Tian Shan range runs uninterruptedly from east to west across the middle of the Xinjiang-Weiwei Autonomous Region dividing it north and south. Now an important trunkline that is continuous with the Lanzhou-Wulumuqi Railroad, the North Xinjiang Railroad, is under construction running westward along the foothills of the Tian Shan, across the southern fringe of the Dzungarian Basin and on to Ala Pass. This railroad is of major significance in connecting Xinjiang with inland China and in hastening the building of northern Xinjiang, as well as in developing foreign trade and strengthening national defense.

#### Extension of the Lanzhou-Wulumuqi Railroad

The North Xinjiang Railroad is an integral part of the Lanzhou-Wulumuqi Railroad.

Back in October 1954, the governments of China and the USSR issued a joint communique on the building of a railroad running from Lanzhou to Wulumuqi to Alma-Atinskaya, which provided that the Lanzhou-Wulumuqi line would connect with international trunk lines in the USSR. After construction of the line, it would connect in the east with the Long-Hai Railroad to form a major artery stretching east and west from one end of the country to the other as another major international trunkline.

Surveying and design work was completed in 1958 for the line running from Wulumuqi to the national frontier, i.e., the North Xinjiang Railroad, and work got underway. In May 1961, construction was halted for cause. Approximately 70 percent of the road bed earth and stone, plus basic abutments for bridges and culverts on the entire project had been completed. The direction followed by the North Xinjiang Railroad now is substantially the same as that of the original design; thus, it is a continuation of construction. The North Xinjiang Railroad begins at West Station in Wulumuqi and goes through Changji, Hutubi, Manasi, Shihezi, Shawan, Wusu, Jinghe and Bole to Ala Pass on China's western frontier for a distance of 470 kilometers. The line connects with the

Dukou Highway, which crosses the Tian Shan to connect northern and southern Xinjiang Province. It intersects the highway that parallels the oil pipeline running from Kalamai to Wulumuqi, and it parallels the highway running between Wulumuqi and Yili, making it a main line in the Xinjiang transportation network.

The Wulumuqi to Wusu section, which is the first phase of construction, is approximately 240 kilometers long. Terrain along this section is flat, most of it being earth strewn with rocks and pebbles. The original design standards call for a first class line of single track with a .006 grade limit, a maximum curve radius of 800 meters, diesel locomotives, electric relay semi-automatic blocking and the construction of one section station and 20 intermediate stations. The near term total volume shipped and received is approximately 7 million tons. 64.9 percent of which is to be incoming and 35.1 percent of which is to be outgoing.

#### The First Joint Venture Trunkline

In recent years, most of the railroads built by the region have been branch lines or connecting lines. The North Xinjiang Railroad, however, is the first network trunk line built as a joint national and regional venture.

Funds required for the section of the North Xinjiang line between Wulumuqi and Wusu were provided jointly by the Ministry of Railways and the Xinjiang Autonomous Region, and both parties jointly established the North Xinjiang Railroad Company to be responsible for carrying out construction. Following construction, the railroad is to be run independently by this company; special transportation rates are to be applied, and profits are to be used to repay capital plus interest. This company will also be responsible for the building and operation of the entire North Xinjiang Railroad.

Reform of the closed management system of single party construction and operation of the road and the institution of joint venture construction and operation has stirred the region's enthusiasm. The Xinjiang Production and Construction Corps and the 36117 unit of the Wulumuqi Military Region are doing the construction work on this railroad project; consequently construction proceeds more rapidly. Work on the section between Wulumuqi and Wusu formally began on 1 May 1985. Plans call for tracks to be laid as far as Wusu in 1987 and the line to be handed over for operation in 1988.

#### Pearls Along the Old Silk Road

The general orientation of the Xinjiang Railroad is along the northern route of the old silk road of 2,000 years ago, which has become a major industrial base today for Xinjiang industry and agriculture. Along the line, numerous newly built cities and towns extend like a string of shiny pearls glinting brightly.

Wulumuqi, the starting point for the North Xinjiang Railroad, is the capital of the autonomous region. More than 2,000 years ago, this area was a pastureland with plenty of water and lush grass. Subsequently, it became a major town on the silk road. During the reign of Xuandi [B.C. 73-48] in the

Han Dynasty, Wulumuqi was a "territory under the rule of Houwang of the state of Cheshi." During the Tang Dynasty, the "northern territory" was established in the eastern part of Wulumuqi. In 1765 (the 30th year of the reign of Emperor Qianlong of the Qing Dynasty), the city walls began to be built. At the time of the founding of New China, the city had a population of fewer than 80,000; the area of the city was very small, and it was economically and culturally backward. Today the population numbers more than 800,000 and the city has an area of more than 40 square kilometers. It has become the political, economic, cultural, and communications center of the autonomous region and a new city on the northwestern frontier of the motherland.

Before liberation Shihezi was still a small village of only 20-odd households beside which lay a dry river bed strewn with broken stones, hence the name Shihezi [or river of stones]. Following liberation, thanks to the arduous struggle of military reclamation soldiers, one storeyed building after another and one industrial plant after another rose on the barren land. Today the new city of Shihezi has a population of 130,000 and an area of 17 square kilometers. It has become an important base for Xinjiang's light and textile industries. Here the streets are clean, green trees form a canopy, the air is clear and the environment is delightful, thrilling the heart and pleasing the eye.

Ala Pass at the terminus of the Xinjiang Railroad is located in Bole County in the Boerdala Monggol Autonomous Zhou all around which is open ground. On both sides of the mountain pass here lies the vast Gobi and grasslands. After the North Xinjiang Railroad is built, this area will become an important entrance way into northwestern China.

The USSR calls Ala Pass the Dzungarian Pass. According to the April 1956 joint conference communique issued by the leaders of the two countries, this was to be the point of connection between the railroads of the two countries. During July of that same year, a railroad delegation from both China and the USSR signed an accord further proposing that the line go to the south shore of Aibi Hu where a rail connection point would be designated. The design prepared at that time called for the establishment of separate transshipment stations at Eherlill (meaning friendship in Mongolian) in Chinese territory and at Druzhba (meaning friendship in Russian) in the USSR. By August 1958, the USSR had constructed a railroad to the frontier. When one stands on an observation platform at a sentry point on the border near Ala Pass, one can see clearly the train station and railroad cars in the USSR.

Construction of the North Xinjiang Railroad lies just around the corner. Then the old silk road will become an artery of iron and steel. In the future, the Long-Hai and the Lanzhou-Wulumuqi lines will be linked to it and rails will connect it to the Soviet railroad. Trade back and forth between China and the USSR, East Europe and the Arab countries will be more convenient and both economic and cultural exchanges will be closer.

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## TRANSPORTATION

### ELECTRIFICATION OF LONG-HAI LINE DISCUSSED

Beijing TIEDAO ZHISHI [RAILWAY KNOWLEDGE] in Chinese No 6, 28 Nov 85

[Article by Feng Jinzhu [7458 6855 2691]: "Mid Section of Long-Hai Railroad Electrified"]

[Text] The section between Zhengzhou and Baoji on the Long-Hai Railroad totals 680 kilometers in length. It extends eastward to Lianyungang and westward through Baoji to connect with the Baoji-Lanzhou, Lanzhou-Xinjiang and Baoji-Chengdu lines. At Zhengzhou and Luoyang, the line intersects the Beijing-Guangzhou and the Jiaozuo-Zhicheng trunklines respectively. At Mengyuan, Xian and Xianyang, it intersects the Datong-Fenglingdu line, the Xian-Huxian line and the Xianyang-Tongchuan line respectively. It is a main transportation artery running across China from east to west, and it is an important route that runs from the coastal provinces to the northwest and southwest. As volume of traffic steadily increases on the Beijing-Guangzhou, Jiaozuo-Zhicheng, Baoji-Lanzhou and Baoji-Chengdu lines, and particularly on the Datong-Fenglingdu and the Xianyang-Tongchuan lines, transportation over this line also becomes increasingly heavy. Despite doubletracking, annual transportation capacity is only 19 million tons, but the actual volume of transportation is more than 20 million tons making this a hard pressed section of the Long-Hai line. To increase transportation capacity of this section of the railroad, and meet needs for hauling coal from southeastern Shanxi, western Hubei and western Shaanxi, in 1982 the state decided on the technical transformation of this section of the line through electrification.

#### Technical Transformation Through Electrification

Acting in accordance with the principle of construction over a period of time and enjoying benefits over a period of time to produce transportation capacity as quickly as possible, it was decided to build up the sections with a weak transportation capacity between Luoyang and Sanmenxia and between Zhengzhou and Luoyang. This would be followed by the building of the section between Sanmenxia and Mengyuan, and finally the building of the section between Mengyuan and Baoji. Inasmuch as this section of the railroad was a first class trunk line where line conditions were fairly good, the amount of technical transformation of the line required in advance of electrification was fairly small. Improvements were needed on only individual sections. In the electrification of this section of the railroad, many advanced techniques and



measures for improvement were used. For example, the main transformers in the pulling transformer station used the fixed reserve method, which both saved on the use of land and reduced the amount of soil excavated while increasing the dependability of electric power supply. Vacuum circuit breakers were used on 27.5 kilovolts. Installation and linking to the capacitance compensation equipment increased the performance factor. The direct current power supply for the transformer station and the section points uses high discharge rate alkaline nickel-cadmium storage batteries to reduce the electrified railroad's disturbance of signaling and other equipment outside the railroad line. Within the pulling electric power supply system, current absorption transformers and backflow line equipment was installed as needed in sections. To save on the amount of land used and use less farmland, most contact grid work areas were co-located with the electric power supply sections on the pulling transformers. Dedicated lines for contact grid track vehicles were used in common with transformer station dedicated lines. Insulators with a 920 mm or 1,200 mm leakage distance were used on the contact grid. This was a 200 to 400 mm increase over those currently used and it greatly increased the degree of insulation of the contact grid and dependability. In addition, to solve the problem of power supply to large electric current sections, heat treated aluminum, magnesium, silicon and rare earth alloys were twisted together to form a carrier force bearing cable. Overhead ground wires were used as post ground connections thereby reducing the effect of post ground connections on signal track circuits. Both main line and station line connection grids used full compensation simple chain type hanging. Communication lines used small co-axial large multiple shielded electric cables. Signaling equipment used electric current concentration, automatic blocking, locomotive signaling and automatic stopping equipment. Time between trains is 8 minutes. Following electrification, traffic capacity will increase from the previous 72 trains per day to 172 trains per day, and hauling capacity will increase from the former 20.5 million tons per year to 68 million tons per year. The train pulling fixed number will rise from the former 2,600 tons to 3,500 tons. Overall transportation efficiency will increase more than twofold, and the transportation shortage situation will be alleviated.

Work began in 1983 and 1984 respectively on the Luoyang-Sanmenxia section and the Zhengzhou-Luoyang section, and plans call for completion at the end of 1986. All the other sections are to be built during the Seventh 5-year Plan period. At that time, the line will connect with the Baoji-Lanzhou electrified railroad over a total of 1,183 kilometers, and the line will become the second longest electrified railroad line in China.

#### Plentiful Material Resources

The Zhengzhou-Mengyuan section of the Long-Hai line is in Henan Province where mineral resources along the line are plentiful. Yima Prefecture is one of four major coal fields in Henan with several billion tons of coal reserves. Bauxite reserves are second largest in the country, large and medium size deposits having been verified at 19 sites. They are found mostly along the Long-Hai Railroad to the west of Zhengzhou and in Baofeng Prefecture near the Jiaozuo-Zhicheng Railroad. More than 1 million tons are mined annually. Molybdenum heads the list of non-ferrous and precious metals. Reserves are large; seams

are thick; quality is high; and other metals are found with the molybdenum including iron, copper, wolfram, lead and zinc. In Lanchuan alone, molybdenum reserves of more than 1 million tons have been verified. Gold reserves amount to more than 900,000 tons, most of them being concentrated in the Lesser Qinling region of Lingbao. The natural oil shale of Zhuquansi in Mixian rivals the quality of the oil shale found in Arkansas in the United States, and it has found ready acceptance by foreign customers.

The Mengyuan-Baoji section of the Long-Hai line begins at Tongguan in the east and terminates at Baojixia in the west. It is located in western Shaanxi Province and traverses the central Shaanxi Plain where the soil is fertile and agriculture well developed, the area having been dubbed "the 800 li Qin expanse." Thanks to the intensivity of agriculture and the extent to which irrigation has developed, this region has become renowned as a wheat and cotton growing area of the country. Eighty-five percent of Shaanxi Province's wheat and 90 percent of its cotton are produced here. Since liberation, numerous large and medium textile printing and dyeing plants have been built at Xian, Xianyang, Baoji, Guozhen, Weinan and Dali, where one-tenth of the country's spindles are located. This is one of the country's major textile industry bases. Large reserves of coal are found along the Long-Hai Railroad that are second only to those in Shanxi for an important position in the country. They begin in the lower reaches of the Jing He and extend eastward through Tongchuan, Baishui, Pucheng, Chengcheng, Heyang, Hancheng, and across the Huang He where they connect with the coal seams of Shanxi, a distance of several hundred kilometers. The area is known as the "black belt of Shaanxi." Yanchang, Fuxian and Luochuan are famous inland petroleum bases in China. In addition, there are many deposits of gold, silver, copper and iron along the line.

#### Important Cities Along the Line

Zhengzhou, the capital of Henan is a communications hub between the north and the south, the east and the west in China. It has been dubbed "impregnable hub that controls a strategic area." Before liberation, it was called the "city of windblown sand," but today it has been transformed into a new style industrial city where industrial plants are as numerous as forest trees and where green trees form a canopy. It has more than 800 large and small metallurgical, electric power, coal, chemical industry, construction materials, electronics, and food enterprises, and it is an important base for the country's textile industry and for its machinery and aluminum smelting. Zhengzhou is one of the centers of China's workers movement. It was the place of origin of the Great "February 7" strike of 1923. The monument to the "February 7 Massacre" towers over the center of the city. It is a unique structure that is imposing and beautiful. From atop the memorial, one can gaze out over the beautiful landscape around Zhengzhou.

Luoyang is located on the south bank of the Huang He in a small basin of the western Henan highlands. Luoyang derives its name from its location on the north side of the Luo River. Luoyang has a long history. Nine different dynasties built their capital here including the eastern Zhou, the eastern Han, the Wei dynasty founded by Cao Cao, the northern Wei, the Sui, the Tang,

the posterior Liang and the posterior Tang, earning the city the name, "ancient capital of nine dynasties." Historic sites are numerous. South of the city is a lookout tower atop a gate that has been named for a famous minister of the Tang Dynasty from which the scenery is beautiful. The Longmen Caves located here are one of the three cave art treasure houses in the country. Baima Temple is one of the earliest Buddhist temples built in China, and is on a grand scale. Luoyang is also a new industrial city, which has nationally renowned tractor plants, ball bearing plants, mining machinery plants, locomotive plants, glass plants, and refractory materials plants. Luoyang is also known as the "poetry capital" and as "flower city." Luoyang peonies are famous in both China and abroad.

Xian is located in the middle of the central Shaanxi Plain that is fertile for 1,000 li around, and on the banks of the Jing and the Wei rivers. It is the largest city in northwest China, and the political, economic, cultural, and communications center of Shaanxi Province. The ancient name for Xian was Chang'an. The city is more than 3,000 years old. Since B.C. 1162, it has served as the capital of 11 dynasties over a period of more than 1,100 years. Peasant rebel armies, including those of Huang Chao and Li Zicheng also established their political power here. This is one of China's six major ancient capitals. Scenic historical sights abound. There is the Xian collection of large stone tablets, the Great Goose Pagoda, the Small Goose Pagoda, the museum at Banpo Village, the tumulus of Qinshihuang, the warm springs at Lishan, the walls of Xian, bell towers, drum towers, Daqingzhen Temple and numerous ruins and ancient tombs serve as genuine Chinese historical and cultural treasure houses. The memorial site to the revolution has an Eighth Route Army Xian office memorial hall. Today, Xian has become a center that attracts the most tourists. Xianyang is located in a corner of the Jiujun Shan to the north of the Wei Shui, hence the name Xianyang. Xianyang was also one of China's ancient capital cities, and contains ruins of the Qin Dynasty capital, Zhou Dynasty tombs, Western Han Dynasty tombs, and Tang Dynasty tombs at many places. Today, the outlines of a new industrial city has begun to take shape. The textile industry is best developed, and its output of cotton cloth and cotton yarn is second only to that of Xian. It has become the second cotton textile base in the northwest. On the banks of the Wei He in Xianyang's western suburb Asia's largest colored kinescope plant has been built with a production of 960,000 kinescopes annually. The both ancient and youthful Xianyang is thriving and full of vitality.

Baoji, located on the western fringe of the central Shaanxi Plain is a choke point for transportation to the northwest and southwest, and it is a concentration and distribution point for materials going into and coming out of Shaanxi, Gansu and Sichuan provinces. It is the second largest industrial city in Shaanxi Province. Construction of China's first electrified railroad will begin here.

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CSO:4006/568

## TRANSPORTATION

### RAILROAD COMMUNICATIONS, SIGNALING EQUIPMENT MODERNIZED

Beijing TIEDAO TONGXIN XINHAO [RAILWAY COMMUNICATION AND SIGNALS] in Chinese  
No 9, Sep 85 pp 1-3

[Article by Electrical Bureau, Beijing Railway Bureau: "Good Performance in Improvements To Hasten Railroad Modernization"]

[Text] I. Important Responsibility of Railroad Electrical Departments

As a result of the efforts made by the whole Party and the whole people of the country since the 3d Plenum of the 11th CPC Central Committee, a historic change has taken place in which the work of the whole Party has shifted to socialist modernization centering around the building of the economy. "Decisions on Reform of the Economic System" prepared by the 3d Plenum of the 12th CPC Central Committee called for a hastening of the pace of reform of the entire economic system focusing on cities. Railroads are to take the lead in the takeoff of the economy. The Beijing Railway Bureau located in the capital city and with railroad routes in three provinces and two cities under its jurisdiction, is responsible for a quarter of the country's freight shipments, an eighth of its passenger transportation, a third of its coal shipments, and four-fifths of Shanxi Province's coal shipments outside the province. To bring about the magnificent plan for quadrupling the output value of the national economy by the end of this century, the Beijing Railway Bureau's volume shipped will have to increase 1.5 fold between 1980 and 2000. To meet this requirement, during the Seventh 5-year Plan period, the state will concentrate financial and material resources in the Beijing Railway Bureau for investment in the building of new lines, double tracking and triple tracking of several hundred kilometers and for the electrification of nearly 1,000 kilometers. Nevertheless, even after benefits are received from these projects, the amount shipped will still not meet requirements. The unfulfilled portion will have to be satisfied through improvement of existing equipment and the tapping of its potential, and through technical progress.

The development of science and technology presently plays a major role in increasing railroad transportation capabilities and in ensuring transportation safety. Electrical equipment is outstanding for being able to produce quick results from small investment. This characteristic has been demonstrated in practice. Completion of automatic blocking on the Beijing-Shanhaiguan Line and on the Feng-Sha main line running from Beijing through Sanjiadian and Shacheng



to Zhangjiakou, "changing from 10 to 8," greatly enhanced these lines traffic bearing capacity, and the opening for use of all electric interlocking at railroad stations reduced the number of moving accidents to the former fewer than 10 percent for extremely remarkable overall economic benefits. These are clear-cut examples. Yet, as railroad transportation develops, as new equipment is added, and as new technology is adopted for use, electrical departments will bear an increased responsibility for safety in railroad transportation. So as to continue to meet the needs of transportation departments, relations between the railroads' electrical departments and other departments will become increasingly close. Railroad electrical departments will shoulder increasingly heavy responsibilities for the safety and high efficiency of railroad transportation.

## 2. Development of the Beijing Railroad Bureau's Electrical Equipment

Thanks to the consideration shown by the Ministry of Railways and leaders of the Beijing Railroad Bureau, the bureau's electrical equipment has expanded fairly rapidly in recent years. As of the end of 1984, the bureau had the following equipment:

Automatic blocking on 2,124 kms, or on 35.7 percent of the distance over which it operates; electric interlocking at 285 stations, or among 42 percent of the total number of stations; six mechanized humps (one of which is semi-automatic); dispatch control on 113.7 kms; and 5,551 kms of electric cables (including 1,887.6 kms of long distance electric cables).

The figures given above show the very rapid expansion of the bureau's electrical equipment in recent years. Furthermore, the scope of service that the railroad electrical system has provided to other sectors of the railroad bureau has also expanded, and its service capabilities have also increased. At the same time, it has added large amounts of new equipment such as 25 Hz inter-area track circuits and frequency shifting automatic blocking equipment. It has also applied computer technology and large numbers of technical innovations. All these things have provided a powerful guarantee of transportation safety and they have raised the effectiveness of available equipment.

To meet needs for development of production, we have carried out efforts to reform the management system and the maintenance and repair system in electrical work throughout the bureau. Reform of the maintenance and repair system has consisted primarily of the promotion of a "three repairs and one checking" system, with increased building of signals repair and spare parts shops, communications signal inspection and repair shops, radio broadcasting station inspection and repair shops, and such electrical maintenance and repair bases. All signal equipment has been brought into the shops for repair and major repairs of equipment on the line has been reduced. As of the end of 1984, the shop repair rate for traffic signaling equipment was 80 percent; the shop repair rate for signal equipment was 70 percent. Shop repairs greatly improved inspection and repair quality and hastened progress in the direction of the industrialization of maintenance and repair work. In addition, standardization and modularization of parts has been achieved for a substantial portion of signaling equipment that has improved equipment



interchangeability and has reduced friction between equipment maintenance and transportation organizations.

Methods adhered to during recent years to raise the level of scientific management and promote all-round quality control. This effort has included the launching of a widespread quality control team campaign. As of the end of 1984, there were 312 quality control teams throughout the bureau that had 75 items on achievements applicable throughout the bureau. These things played a fine role in assuring transportation safety, in upgrading transportation efficiency, in improving equipment performance capabilities, and in improving the technical quality of the corps of employees itself.

### 3. Emphasis on Reform For A Greater Contribution to the Modernization of Electrical Equipment

Since the transportation responsibilities for which the Beijing Railways Bureau is responsible are extraordinarily important, electrification improvements and electrification projects are very numerous. Several problems urgently in need of study and solution exist in the prevention of electrical interference and in consistency and reliability of 25 Hz track circuits between areas and on frequency shifting automatic blocking equipment.

To insure train safety, automatic control techniques for train traffic have been placed on the daily agenda of important things to do. Upgrading and technical improvement of the quality of use of dispatching centralization, dispatching supervision and locomotive signaling equipment will be important.

Electronic computers have now begun to be used to monitor operation of all electric interlocking and hump equipment so as to provide scientific data for a transition to control of repairs. Expansion and promotion of repair control is necessary to bring the level of improvements of the maintenance and repair system to a higher level. Much work remains to be done in the further summarization, perfection and promotion of this system.

Demands on communications equipment result mostly from the rapid rise in volume of information required by the increase in railroad transportation volume and the modernization of control work. Consequently, railroad communications systems have to be able to transmit diverse kinds of information, thereby improving the quality of service. Work on a computer network for the Beijing-Shanghai circuit that was begun more than 2 years ago is without doubt a pilot project for and an integral part of this kind of work.

It has been decided to introduce an optical cable four cluster 140 Mb digital communications network in construction of the Da-Qin Line, and all of the exchange equipment will be 1980's programmable exchanges. Once the Da-Qin Line has been completely built, it will also be China's newest and most versatile integrated digital network (IDN). Plans have already been approved for the communications network on the Beijing-Zhengzhou trunkline where optical cable equipment will be used. All these developments will cause the Beijing Railway Bureau's communications equipment to develop to new heights.

Use of composite train techniques has effectively increased transportation capacity, but it has also brought a series of problems in its wake for the use of electrical equipment. Electrical units will play a major role in perfecting synchronous control techniques for multiple locomotives. Increase in train tonnages and train density will add new factors requiring consideration in electrical maintenance and repair work. Train traffic organizational work will require electrical departments to increase their lateral liaison with other units. All these things require diligent study as a part of reform work. There is bound to be further expansion of electronic computer technology into electrical equipment. Electronic computers are not only a tool for control and monitoring, but they will become the heart of electrical equipment as well.

In today's world in which a new technological revolution has arrived, the railroad sector in all countries is giving serious attention to progress in communications and signaling equipment in the same way that they devoted serious attention in the past to the development of railroad pulling power and railroad construction. Since electrical equipment has increased rapidly in the Beijing Railway Bureau, even though organizations, employees at all levels have put forth great efforts; nevertheless, progress in improving the skills of electrical personnel still lags behind the development of equipment. The quality of personnel is far from being able to meet work requirements. There are glaring gaps today in the technical training of electric staff members and workers, in improvement of the vocational training of new employees, in updating knowledge of engineers and technicians, and in improving the managerial skills of managerial personnel at all levels. Consequently, we will have to proceed from China's circumstances and circumstances as they exist on railroads to propose measures for dealing with the realities of the transportation tasks that confront the bureau and the realities that confront development of electrical equipment, and we will have to hasten the modernized building and modernized management of communications and signaling equipment on the basis of what is scientific, advanced, economical and feasible. Today the railroads' electrical departments are bending every effort to improve maintenance and repair work, to rid the railroads, to the maximum extent possible, of all kinds of things that contribute to a lack of safety, and to ensure safety and high efficiency in railroad transportation.

Employees concerned with electrical work throughout the bureau bear a heavy responsibility and have a long road to travel. Every employee concerned with electrical work should bring to bear his intelligence and knowledge on his own glorious work position and make a greater contribution to the modernization of the bureau's electrical equipment.

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## TRANSPORTATION

### ROADS CITED AS PREREQUISITE FOR RURAL DEVELOPMENT

Beijing GONGLU [HIGHWAYS] in Chinese No 9, 25 Sep 85 pp 2-8

[Article by Zhu Xuewen [2612 1331 2429] and Zhu Hong [2612 4767]: "Marked Changes Needed in Highway Conditions During Seventh 5-Year Plan"]

[Text] Dramatic changes occurred in the development of China's national economy and society following enunciation by the 12th CPC Central Committee of the magnificent strategic goal of quadrupling the gross output value of industry and agriculture by the end of this century, and the two stage strategic plan for achieving this goal. Output of China's industry and agriculture has grown tremendously in recent years. Commodity production has developed rapidly; large numbers of village and small town enterprises and all sorts of specialized households and economic partnerships have come into being; the income of 800 million peasants has risen tremendously; and the rural economy has begun to develop in the direction of specialization, commodity production and modernization. Reform of the economic system centering on cities, and further implementation of a program to "enliven the domestic economy and to open the country to the outside world;" and acceleration of the building of special economic zones and the establishment of open cities and of open economic zones along the coast have sparked development of the inland economy. These multi-level strategic economic development plans that have gradually swelled from the outside to the inside and from the seacoast to inland areas have placed heavy burdens on passenger and freight transportation. Nowadays, there is an urgent need for quick, direct, readily available, safe and comfortable modern highway transportation between cities and the countryside, between one city and another, and between the coast and the heartland. Peasants, specialized households and village and small town enterprises all want to buy various kinds of special purpose motor vehicles that are fuel efficient, comfortable and produce high benefits. They want highways to go into rural villages to provide the peasants with inexpensive, good quality and readily available transportation. Quite a few places want to build high quality highways and high efficiency trunk highways that can open markets for ever increasing supplies of products, that can satisfy needs in carrying out large scale socialized production, and that can satisfy the steadily increasing needs of the people, and particularly the needs of 800 million peasants, for industrial manufactures, science and technology, culture and education. This trend presages a new stage of development of China's highway transportation.

For a long time, neither theory nor practice in economic planning has addressed the issue of transportation having a role in advancing and restricting socio-economic development of the whole country, and the need to build highways first as a precursor to rural development. Consequently, within the transportation and communications system there has long been an emphasis only on railroads to the neglect of the role of highway transportation. There has been a failure to realize that highway transportation is not only closely related to railroads in the communications and transportation system, but that in inland areas and in remote provinces and regions, once the commodity economy has progressed to a certain extent, highways play a major role as trunklines, and that highways and railroads are mutually complementary and jointly constitute a complete transportation system. Investment in highway transportation has been cut repeatedly with the result that the highways are extremely antiquated and there is no dovetailing of the various forms of transportation. This has meant greater gaps and more striking contradictions in a communications and transportation system that was not adequate to begin with.

How to make use of the favorable circumstances provided by opening to the outside world and reform, to abide by the law that transportation has to come first, and to build a transportation industry is a strategic key to China's quadrupling of the gross output value of industry and agriculture by the end of this century. In recent years, leading comrades on the Central Committee have pointed out repeatedly the need to readjust the pattern of transportation, to hasten the building of highways, to increase the proportion of highway transportation and to make use of the transportation network's overall transportation capabilities. Most recently, Premier Zhao pointed out once again that change in the pattern of transportation is a guiding program in building the country during the Seventh 5-year Plan. The proportion at which the transportation system should be maintained in the national economy, the reciprocal role of various modes of transportation and the laws governing their interdependence bear on strategic goals, the pace and the programs and policies for development of China's transportation. These are matters that await study and decisions by the authorities concerned. This article only proposes some exploratory views on how to proceed with highway construction and the level to be attained during the Seventh 5-year Plan.

## 1. Readjustment of Transportation Patterns Requires Acceleration of Highway Construction

### 1. Status of and Problems With China's Highways

China's highway transportation system today lags half a century behind that of advanced countries in Europe and the Americas. Highways are China's weakest link. During the 1950's, China devoted serious attention to the development of its transportation, making highway construction a strategic action for strengthening national defense. Highway construction was made a part of state capital construction plans, and investment in highway construction amounted to approximately 3 percent of total investment in capital construction nationally. The building of national trunk highways was centrally controlled by the state. Under aegis of this policy and system,



national trunk highways were built between Chengdu and Laoyingyan, Baoji and Chengdu, Sichuan Province and Guizhou Province, Chongqing and Xiaguanying [Gansu], Sichuan Province and the Xizang Autonomous Region, Qinghai Province and the Xizang Autonomous Region, Fuzhou and Wenzhou, Shenyang and Mudanjiang, and Weixian [Shandong] and Shijiazhuang [Hebei], which remain mainstays among the country's highways. During the late 1950's, authority to build highways was transferred to a lower level and for the past 20 or more highway construction has had to depend on road maintenance funds collected by individual jurisdictions to maintain simple reproduction, plus some national border defense funds, construction work done by civilian laborers, and operation conducted by the local people with subsidies from the state for partial improvements and upgrading. After the 12th CPC Central Committee made the building of transportation to carry energy a strategic focus, only railroads and seaports received attention and highway construction still had no place in line among national capital construction plans. During the Sixth 5-year Plan period, highway construction remained dependent on approximately 1.3 billion yuan in national border defense funds and on a small amount of local investment; however, approximately 2.3 billion yuan of funds for energy capital construction were taken out of road maintenance expenditures. During the Sixth 5-year Plan, highway distance for China as a whole averaged an increase of approximately 10,000 kilometers annually. This was lower than the historical average annual increase of between 20,000 and 30,000 kilometers annually. Standards for improvement of highway quality were maintained at those of the Fifth 5-year Plan period or slightly lower. As of the end of 1984, 38 percent of the nation's 920,000-odd kilometers of highways were substandard highways that did not meet technical standards; 47 percent were minimum standard single lane rudimentary highways, and 13 percent were dual lane highways able to accommodate only old medium size motor vehicles (4 ton Liberation trucks) for the most part, and a mixture of all sorts of vehicles traveled over them. Only 20 percent of the total highway distance was surfaced roads that markedly conserve fuel and lower transportation costs, and except for a small number of asphalt surfaced roads, an overwhelming majority of these had a 2 to 3 centimeter thick oil waste topping. Moreover, more than 60 percent of these had been used for longer than the period for which they were designed and were urgently in need of patching and improvement. There are more than 5,000 townships and more than 260,000 rural villages (or production brigades) in the country that have no roads. On trunk highways, there are more than 200 fording points that have no bridges; more than 4,000 kilometers of roads simply dead end, and 1,000 bridges an estimated more than 40,000 linear meters long are urgently in need of improvement. Ninety-two percent of the 620,000 kilometers of county and township highways are substandard for minimum standard fourth class highways, more than half of which are unsurfaced or have been topped with a simple mixture of mud and crushed stone that cannot be traveled in all kinds of weather. Once rural villages carried out reform of the economic system and promoted contract responsibility systems linked to output, as grain yields rose somewhat and rural commodities increased slightly, difficulty finding transportation, difficulty in boarding buses, and blocking of the flow of commodities occurred in cities and the countryside everywhere. For example, a bumper corn crop in northeast China required the outshipment of 22 billion jin annually; however, high costs made highway transportation undesirable, neither railroads going southward past the Great Wall nor seaports had the



necessary handling capacity and highways going to and from ports and railroad stations were not able to concentrate the corn on the one end and distribute it on the other. As a result, arrangements could be made to ship only slightly more than 6 billion jin. More than 10 billion jin of corn is added to storage annually and the cost of storage runs to between 1.7 and 2 billion yuan. Moreover, if the grain remains in storage for more than 3 years, it spoils. It cannot be eaten, much less exported.

Another example occurred in Shanxi Province, China's major coal production base. The Taiyuan - Shijiazhuang Highway is one of the main thoroughfares for shipping coal out of Shanxi, carrying approximately 20 million tons annually. Guiguan in Pingding County on the Taiyuan-Shijiazhuang Highway is the "eastern gateway" to Shanxi Province, and the distance between Pingding, the county seat, to Jiuguan is 37.5 kilometers over a third class highway through a mountainous region that was built in 1969 and that was substantially able to handle the volume of transportation up until 1978. From 1980 onward, Shanxi's outshipments of coal gradually increased, and the volume of traffic over the highway between Pingding and Jiuguan shot up from 4,000 vehicles per day to 10,000 vehicles per day, and sometimes going as high as 15,000 vehicles per day. This was more than five times the maximum volume of traffic that a third class highway is able to carry. Since the road was narrow and vehicles numerous, accidents were numerous and the road was frequently blocked. During November 1983 alone, the highway was blocked more than 30 times. This included a serious traffic jam accident at Jiuguan in which more than 10,000 vehicles were blocked in the foothills of the Taihang Shan for 2 days and 2 nights. Authorities estimate a decreased output value of between 1.1 and 1.5 billion yuan from production enterprises attributable to traffic jams during 1984, and a 20 million yuan reduction in earnings of motor vehicle transportation enterprises.

Another example is in the golden delta region of the Chang Jiang from Shanghai to Nanjing where there is no through highway to connect Suzhou, Wuxi and Changzhou in China's most developed region. Most of the more than 300 kilometers of existing highways are of third or fourth class standards, and some road sections dead end and permit the passage of vehicles only with difficulty. Vehicle speeds average only 30 kilometers per hour making it impossible to reach one's destination after traveling all day long.

The foregoing situations show that highway transportation is already unable to keep up with development of the rural commodity economy, with needs for the transportation of energy or with the opening of the country internally and externally.

## 2. The Role of Hastening Highway Construction Under New Circumstances

(1) Development of the rural commodity economy and readjustment of the structure of agriculture have placed higher requirements on transportation.

Reform of the rural economy has destroyed the longstanding stagnation of agricultural production in China, and emancipated the country from the shackles of the traditional self-sufficient or semi self-sufficient economy in a transformation toward large scale commodity production and modern

agriculture. The gross output value of agriculture increased by an average 7.9 percent per year from 1979 through 1983, and in 1984 gross output value was 14.8 percent higher than in 1983. The average annual increase in gross output value was more than double the 3.2 percent per year for the 26 year period from 1953 through 1978. Grain output increased 100 million tons in 6 years, output breaking the 400 million ton mark. Output of cotton, oil-bearing crops and sugar crops more than doubled. Very great increases also occurred in output of other cash crops and agricultural sideline products. Furthermore, village and town enterprises developed even more rapidly. Today, there are 1.35 million township and town enterprises throughout the country with a gross output of 150 billion yuan. Peasant income has also risen from the 134 yuan of 1978 to 355 yuan. In Wuxi County in Jiangsu Province, for example, commune member income was 709 yuan per capita in 1984. Expansion of agricultural production has spurred changes in the structure of industry. A large part of the workforce has been emancipated from farming to work in industry and business, in construction, in transportation and in the service trades. According to 1984 statistics for 25 provinces and cities throughout the country, 14 percent of all peasant households were specialized households, the percentage of such specialized households engaged in non-agricultural production having risen from 25 percent in 1983 to 33.6 percent in 1984. The commodity rate for agriculture increased from the 35.6 percent of 1978 to 53.3 percent. As a result of expansion in the circulation of rural commodities, the exchange between cities and the countryside has burgeoned and rural passenger and freight transportation has risen rapidly in recent years. It has been calculated that 2 billion tons of goods moved over rural highways in 1984 and that passenger travel amounted to between 2.5 and 3 billion people for an increase averaging more than 15 percent per year. A random sampling of three 100 million yuan villages in Jiangsu Province showed that peasants traveled on a modern means of transportation 29 times a year, 24 times by motor vehicle. Clearly, as the rural economy develops, high speed growth of highway passenger transportation is taking place. To make up for the shortage of transportation in the country, since 1983 individuals have been encouraged to buy motor vehicles for the transportation and sale of agricultural and sideline products and for short distance passenger transportation. Rural households specializing in transportation have to transport so as to make a living, and they have become an important integral part of specialized rural production households. Statistics show nearly 350,000 motor vehicles in rural villages as of the end of 1984, or five times the 1978 figure. In 1985, the state drew up another 10 policies for further enlivening of the rural economy that call for the use of a certain amount of financial and material resources to support development of processing industries for agricultural products in principle grain producing areas, and for support of the development of animal husbandry, the aquatic products breeding industry and forestry. These policies encourage development of mining, livestock feed industries, the food industry and operation of tertiary industries. At the same time, more urban industry and technology has been transferred to the countryside, to townships and towns, thereby linking more closely the economies of cities and the countryside. For a fairly long time to come, the need for rural transportation and exchanges between cities and the countryside will continue to grow rapidly, and the volume hauled will also rise steadily. The state will sell motor vehicles directly to peasants in 1985, and it is anticipated that large numbers will be sold in the future. Once there are a large number of motor vehicles, the peasants will become

dissatisfied with the roads. Once roads have been improved, not only will travel be more convenient, but vehicle speeds will increase and transportation costs and waste of materials will decline greatly. This will stimulate development of the rural economy in turn. Take the situation in Zuoyun County in northern Shaanxi, for example, where income in 1978 averaged only 78 yuan per capita. During the past several years, this county has emphasized the development of transportation, so that virtually every village is accessible to motor vehicles. It also developed a mining industry and the growing of cash crops. Now income averages 820 yuan per capita making it one of the richest counties in the whole country in terms of per capita earnings.

Another example is the several 100 million yuan townships in Wuxi County where rapid development took place only after highways had been built. Qianzhou Township, notorious throughout China, was known prior to 1976 for being backward in three ways: It was backward in transportation, having no roads; it was backward in agricultural production, having no mechanization; and it was backward in that its grain yields and distributions to its commune members were among the three lowest of 36 townships and towns in the county. To bring about a change in its backward condition, between 1970 and 1977 the Qianzhou Village CPC Committee and township government began to organize the 21 production brigades in the township, a workforce of nearly 10,000, in the construction of 35 kilometers of new rural roads, 7 kilometers of trunk highways and 237 bridges totaling 2,844 linear meters in length. By 1980, 21 villages were accessible to motor vehicles; tractors could move around from one brigade to another, and the township set up a motor vehicle transportation unit. Development of highway transportation gave powerful impetus to the development of rural industry. In 1970, output value of industry for the whole township had been only 1.53 million yuan. In the 7 year period between 1978 and 1984, the output value of industry grew by approximately 31 percent each year reaching 156 million yuan in 1984. In a period of 7 years, the township's industrial output value increased 5.6 fold. Four major changes had taken place as follows: First was a major change in agricultural production conditions. Second was a major change in industrial production conditions. Third was a major change in transportation conditions; and fourth was a major change in the standard of living. Today the masses expectations are for "nutritious food, spacious housing, pretty clothing, high quality products for use in daily life, and convenient transportation." Qianzhou Township's change from being backward in three ways to four major changes, and Zuoyun County's change from poverty to riches is attributable primarily to resolute implementation of the line, programs and policies of the 3d Plenum of the 11th CPC Central Committee, and the carrying out of reform of the rural economic structure. This has been a great victory for the Party's rich peasant policy. Nevertheless, objectively speaking, for the rural commodity economy to develop, transportation has to come first. It is particularly necessary to provide safe, convenient, on time, and door-to-door direct transportation between cities and the countryside to satisfy and promote all-round development of rural trade, industry and agriculture.

(2) A rapid and direct transportation network that links areas both internally and with other areas is urgently needed for development of economic zones centering around large cities and for development of coastal areas open to the outside world. The blocked economy that existed for many years in which

political and business matters were intermixed and central and local authorities were cut off from each other shackled development of the country's productivity. Reform of the economic system was for the very purpose of changing this rigid economic pattern into an open multi-level network economy that would increase the vitality of enterprises, promote a specialized and cooperative division of labor, and hasten development of the economy. But this could not be done without a developed transportation system. Take the Shanghai economic area, for example. This economic area has a population of nearly 200 million, and the output value of its industry and agriculture is one-fourth the total for the whole country. The area has 14 large cities, a galaxy of human talent, a plethora of institutions of higher learning, and plentiful scientific and technical forces. It has five port cities that open to the outside world and the Chang Jiang delta open economic zone that ease the importation of foreign investment and technology. It has a developed industrial foundation and agricultural and sideline products bases, richly endowed coastal areas and territorial seas, plus coal, iron and non-ferrous metals from Anhui and Jiangxi provinces. On the other hand, sole reliance on water transportation and railroads to bind together organically Shanghai and the 30-odd large and medium size areas in the area as well as the farflung countryside, township and town is grossly inadequate. High speed highways between Shanghai and Nanjing and between Shanghai and Hangzhou as the backbones of a system for linking the major cities in the area with the major parts in a high speed trunk highway system is indispensable. Such a system could link city and rural roads in all directions; could help link large and medium size cities with each other; and could link all the open cities, ports along the coast and along the rivers with the hinterland to spark the development of northern Jiangsu, Anhui, Jiangxi, and Zhejiang provinces. The interlinking of water transportation, rail transportation and civil aviation, each performing the task it is best able to perform, could markedly improve fairly rapidly transportation conditions throughout the region. A rapidly growing open style, network-like Shanghai economic area would become a turnkey vigorous all-round development of China's economy.

(3) Division of transportation between highways and railroads, each performing the task it is able to do best could fairly quickly upgrade overall transportation capabilities and benefits from the entire transportation system, and would ameliorate the chronic transportation shortage. Furthermore, improvement of highway conditions is a prerequisite for making the most of the advantages that motor vehicle transportation provides. China's poor roads, the backwardness of the way its vehicles perform and inequities in transportation prices have forced on to the railroads large amounts of freight and passengers traveling intermediate and short distances that might better have been carried by highways. Since 1983 attention has been devoted to having part of the flow carried by highways, and as of the end of 1984, more than 500 road transportation routes to carry part of the flow had been established, and they carried 400,000 passengers a day. This was more than one-tenth the volume of passenger traffic carried by the railroads. Highways played a very good role. Road transportation potential is still a long way from being used to the full, however. Statistics show road passenger transportation as being approximately 20 percent of railroad passenger transportation in terms of ton kilometers, and road traffic capacity as being between 40 and 50 percent that of railroads. Forecasts calls for a quadrupling of the volume of passenger



transportation for China as a whole by 1990, and an approximately 60 percent increase in the volume of railroad passenger transportation as well. Furthermore, some of the busiest railroad passenger lines are trunklines for hauling coal, so the need to ensure that coal is hauled will make difficult the addition of more passenger trains. Expansion of train classification is a good method of increasing traffic, but the increase in carrying capacity would be able, at best, to satisfy only about one-half the need for additional transportation. This transportation capacity could best be used for the hauling of passengers a distance of 200 kilometers or more. Much of the intermediate and short haul passenger transportation should be shifted to highways. Passenger travel 800 kilometers or farther should be handled partly by civil aviation as part of a fundamental plan for solving travel difficulties. In 1984, the railroads refused 1,215 pieces of loose freight. They stopped running 53 express trains with only a few cars, and thus increased line capacity by scores of millions of tons. Were highways paralleling busy railroad sections to be improved and further use made of the role of highway transportation, it has been roughly estimated that the increased railroad transportation capacity would be equal to that of two Da-Qin [possibly Dalian to Qinhuangdao] lines, and capable of hauling more than 60 million tons of coal from Shanxi, Shaanxi and Henan to east China. Not only would this greatly alleviate the transportation shortage, but direct benefits for the economy would be considerable.

(4) Development of the provinces of south China urgently requires building of new transportation trunk lines. Only if highways lead the way can this problem be solved fairly quickly.

Economic development in the eight provinces of Sichuan, Yunnan, Guizhou, Hunan, Guangdong, Guangxi, Fujian and Jiangxi is lower than the average for the country as a whole except in the Zhu Jiang delta. In Jiangxi Province, which neighbors Jiangsu Province, per capita national income is less than half than of Jiangsu Province. To bring about gradual change in this backward situation in the economies of these regions, solution to the problem of a lack of readily available transportation is necessary first of all, with the carrying out of a development strategy whereby coastal areas give impetus to inland areas. The present population of these eight provinces is approximately 380 million, or 36.7 of the national total. They have approximately 13,000 kilometers of main railroad lines, or only 22 percent of the national total. Since line standards are low, the annual volume of freight hauled is less than 16 percent of the total for the country. These provinces have 41 percent of the highway distance in the country. Though this is no small percentage, most of it is not up to standards. These provinces have only 18,000 kilometers of first, second and third class roads, or 13 percent of the national total. They have approximately 45,000 kilometers of shipping routes, but few of them have been maintained except for the Chang Jiang, and they are underutilized. It is understandable that the people of this region earnestly hope that a railroad will be built; however, problems in building railway projects in mountainous areas are daunting; construction costs are high; and a lot of time is required to build them. Over the near term, the building of transportation within the country should focus on improvements. Even if planning is done during the mid and late 1990's, it will be difficult to put plans into effect by the end of the 20th century. Another matter is that the investment required for building



a railroad with an annual traffic volume of 5 million tons or less is not cost effective. Therefore, the policy for building transportation in this area should make full use of the navigation of the two great river systems of the Chang Jiang and the Zhu Jiang, and highways should come first when land transportation trunk lines are to be built. Transportation lines for exports have to be built in the near future for Yunnan, Guangxi and Guizhou provinces and for southeastern Sichuan, to create conditions for development of the Wuling Shan region where these four provinces meet. Jiangxi Province has to be linked closely to Shanghai and to the Chang Jiang and coastal open economic zones. A circumferential highway should be build around Hainan Island in order to hasten development of the island. If construction of these highways is completed during the Seventh 5-year Plan period, it will be possible to lay a fine foundation for vigorous building of the province of south China during the following decade.

(5) Strengthening of national defense in border regions, the building up of borderlands, and development of the economy of minority nationality areas requires the building of a corresponding transportation system.

Most of China's border regions are inhabited by minority nationalities. Not counting the provinces of southwest and northeast China, the area of Xinjiang, Xizang, Nei Monggol, Ningxia, and Qinghai totals 4.84 million square kilometers, or one-half the total for the whole country. Population is more than 42 million, or 4.2 percent of the national total. In 1983, the gross output value of industry and agriculture in these regions was 27.6 billion yuan, or 3 percent of the national total. It may well be said that the land is vast and the population scant; the economy is also fairly backward. Despite the limitations of the region's national economy over the short term, since its resources have yet to be completely surveyed, large scale development cannot be undertaken. Moreover, the potential of its underground treasures and of the land awaiting development is very great. it is a vast field for future economic development. This region's transportation is characterized by long distances and a small volume of traffic. Thus, it is suited to the development of air transportation. Except for the movement of coal by railroads and of petroleum by pipelines, land transportation should consist primarily of the development of high tonnage trucks and truck trailers. A combination of highways air transportation needed for national defense should be used to developed a highway and air transportation system for use by both the armed forces and the civilian sector.

## 2. The Distribution of Highways in the Overall Transportation Network

The building and distribution of highways must proceed from needs in developing the national economy. In the planning and allocation of investment for a transportation network, likewise the role of highways should be accorded the position it deserves.

Highways can go to industrial plants, to mines, to rural villages, to cities and towns and to the various places where people carry on production and daily life. Consequently, they have always been termed ribbons that link city and country, and they are also branch lines on which railroads, water transportation and air transportation rely for the concentration and

distribution of passengers and freight. They are like the capillaries in the human body, which though small are indispensable. But, it is not enough that our understanding halt at this level. The changes that have taken place in the structure of transportation in Japan and western Europe ever since the 1950's, with highway transportation surpassing railroad transportation, have positively not been because of the small land area of these countries. Rather they reflect socio-economic development to a certain stage, and they result from changes that have taken place in the industrial structure and people's social lives. Some comrades suppose China to be a continental country with a vast land area in which the structure of transportation should continue to be railroads for the most part. Admittedly, since distribution of the country's natural resources and its economic development are uneven, the hauling over long distances of minerals such as coal and iron and of large quantities of freight necessitates reliance on railroad and water transportation. Yet viewed from another angle, this is not the whole story. First of all, a look at the movement of passengers, one of the two major functions of transportation, shows the percentage of passengers carried by railroads to be declining gradually while the percentage carried by highways is rising rapidly. Passenger turnover for railroads is declining at about 1 percent per year, while it is rising 2.4 percent for year for highways. It is anticipated that by the end of the 1990's, highways will carry more passengers than railroads to become the number one mode of transportation. There is a shortage of passenger transportation now, but it will grow at high speed in the future. Railroads will expand the classification of passenger trains increasing the number of cars from 17 to 20 to increase the number of passengers carried by trains. This will moderate some of the shortage of long distance passenger transportation. But primary reliance on railroads will be unable to solve this problem. This is not solely because there is a limit to the number of passengers railroads can carry. More importantly it is because passengers will take up a large part of railroad lines' traffic capacity, and reliance on railroads to solve the passenger transportation problem is not cost effective nor does it make sense in terms of the use of transportation capacity or in results from investment. It is necessary to make use of the overall transportation capacity of the transportation network, to accelerate use of airlines and to make use of passenger transportation on the Chang Jiang and along the coast. This will require highway transportation to assume a greater role in passenger transportation. In sections of railroads where passenger transportation is short, in particular, highways can take over responsibility for passenger transportation to a distance of 200 kilometers or less. Second, looked at in terms of economic development, transportation of the country's main source of energy, coal, relies primarily on railroads. Two-thirds of China's coal output is hauled by railroads, and railroad transportation is certainly extremely important for this purpose. But, how can the railroads be made to haul more coal? The railroads intend to run heavy duty combined trains, to increase the percentage of ganged through trains, to reduce intermediate stops, and to carry less short distance and odd lot freight. To take these actions without coordination with highway transportation will not do. Because highway transportation provides rapid service directly to intended destinations, produces little damage or losses, with improvement of highways and truck performance, it will rapidly become economical for transportation over long distances. With the rapid development of medium size and small enterprises and of small cities and towns, as well as

of economic zones that depend on large cities, and particularly for coastal areas and areas open to the outside world such as the Shanghai Economic Zone, for Liaodong, the Shandong promontory and their hinterlands, for the special economic zones in Guangdong and Fujian provinces, and for the Beijing, Tianjin, Hebei and Shanxi areas, highways serve not only as capillaries in the structure of their transportation systems, but also play a role as major transportation trunklines cutting across administrative zones. Our overall planning for a transportation network has to rid itself of the shackles of longstanding traditional concepts of a blocked economy. It has to become emancipated from a transportation structure used primarily for the transportation of raw materials and primary products, focusing instead on how better to use and improve the movement of people and goods and to upgrade transportation efficiency and quality. If these points are ignored, our planning will lag behind the needs of the times.

On the basis of the foregoing appreciation, we believe that the pattern of highways in the overall transportation network as well as the planning and building of them has to take full account of the following three matters:

(1) A local road system that has as its primary function the linking together of cities and the countryside and medium size and small cities, this system to include all county and township roads plus most provincial and municipal trunkline highways. This system would be strongly local in character, with provinces (or cities and autonomous regions) being responsible for planning and organizing it. To accomplish this, provinces (cities and autonomous regions) would have to be assured sufficient financial and material resources.

(2) A national trunk highway system that connects large and medium size cities plus major ports and airfields, and that forms, together with railroads, a joint land transportation transportation trunkline network. This would include existing national highway trunklines plus some highways for the hauling of coal for distribution of goods from ports, and the building of highways. This system would be centrally planned and organized by the state. When state funds are inadequate, consideration could be given to joint investment by the central government and local governments; however, it would be necessary to make sure that local governments would not have to provide too much investment, otherwise local governments' construction and improvement of local highways would be adversely affected.

Over the short term, highway construction should be concentrated in economically developed areas fanning out from large and small economic centers and radiating from the seacoast inland. It would include the building of major trunkline highways of decisive importance to regional development such as the Beijing-Tanggu and the Guangzhou-Shenzhen expressways, and the improvement of trunk highways that parallel railroads or highways that directly link large and medium size cities and that are markedly deficient in providing good transportation over distances. It would include improvement of service. Trunklines carrying a high volume of traffic would have to solve problems in the mix of freight and passenger transportation and operate fast and slow trains on different tracks. In provinces that have not yet been developed, new trunk highways should be built.

(3) In frontier areas (notably Xinjiang and Xizang), a transportation system should be built that consists primarily of roads and airlines that is closely linked to national defense needs but that is used by both the armed forces and the civilian sector for national defense and economic purposes.

### 3. Scale of Road Construction During the Seventh 5-year Plan

In view of the objective of quadrupling of the country's gross output value of industry and agriculture by the end of this century, and strategic planning calling for two steps to achieve this goal, by how much should road transportation multiple? What level should the building of roads achieve for a balance among all modes of transportation, to build overall transportation capacity, to satisfy needs of society and of production, and to insure planned coordinated development of the national economy? On the basis of major economic indicators for this century, through reference to historical development and to road traffic volume and production created as a result of industrialization in foreign countries and to proportional relationships among the various needs of society, and through taking into consideration the new transportation situation brought about by changes in the structure of industry and in the regional economic structure as a result of reforms and opening to the outside world, authorities have predicted road traffic volume will reach more than 20 billion tons by 2000. This will be a five fold increase or more over 1980. If road transportation is looked at in terms of a moderate level of service, average vehicle speeds on trunk highways will be 50 percent higher than at present reaching 46 kilometers per hour, and average vehicle speeds over the road system will increase by one-third reaching 37 kilometers per hour. Virtually every township and town will be served by roads. On the basis of these speeds and percentages, between 1.2 and 1.5 million kilometers of roads will be needed for the whole country. This includes 15,000 kilometers of expressway and first class roads, between 100,000 and 110,000 kilometers of second class roads, and between 400,000 and 500,000 kilometers of third class roads or one-third of the total road distance. Between 450,000 and 500,000 kilometers of road will have high grade or secondary grade surfaces. This will require an investment of between 165 and 170 billion yuan at current prices and costs. The crux in exceeding this goal will be funds. We should neither onesidedly emphasize a shortage of funds as a reason for not going ahead with transportation first, and building roads as the first form of transportation, nor should we do more than national financial and material resources permit. We have to take into consideration the national shortage of funds, use limited funds where they will do the most good, and make sure that they are invested in the building of key road projects that are urgently needed and from which quick results can be obtained from small investment so as to derive the most social benefit as early as possible.

Strategic plans for development of the national economy call mostly for the laying of a good foundation, the husbanding of strength and the creation of conditions during the first 10 years of the last two decades of this century to enter a period of vigorous new economic construction during the last 10 years. Road construction should likewise be done in two steps. During the first 10 years, efforts should be devoted to turning around the shortage of road transportation; during the second 10 years, efforts should go to opening



up new areas to road transportation. But, 5 of the first 10 years have already passed without any change for the better in the backward state and short supply of roads. On the contrary, the situation has worsened. Firm grip has to be taken on the fine opportunity and the crucial period provided during the remaining 5 years to make sure that during the Seventh 5-year Plan period that simultaneous with looking after increased needs for current years, consideration will also be given to paying up the debt that has accumulated over the years as a result of the shortchanging of road transportation. Then, during the last 10 years, it will be possible to enter a new period of vigorous economic growth in which needed transportation capacity will be made ready, thereby laying a good foundation to meet the needs of the national economy. On this basis, in 1990 roads in should be able to handle between 9 and 10 billion tons of freight (including between 2.5 and 3 billion tons of rural freight), and between 8.5 and 9.5 billion passengers (including non-collective enterprises). By the end of the Seventh 5-year Plan, the country should have approximately 1.1 million kilometers of roads. But, inasmuch as there will be a shortage of funds and materials for investment in road construction during the Seventh 5-year Plan, and since time will be needed for preparatory work during the previous period and there will be a shortage of technical equipment. the policy to be followed should be mostly one of a combination of improvements and new construction with improvements being paramount. Emphasis should be on improving the traffic capacity of key economic trunk highways, on improving busy roads for the transportation of energy from energy bases and for distribution of freight from ports, stations and open cities, branch roads connecting to railroads and roads carrying goods into and out of large and medium size cities. Various methods should be used to build county and township roads and to hasten road construction in impoverished areas. By the end of the Seventh 5-year Plan period, road distance for the whole country should be a minimum of 1 million kilometers.

There should be 5,000 kilometers of expressway and first class roads. An estimated 5,000 kilometers of expressway and first class road sections should be built that are able to accommodate 5,000 vehicles per day. By the end of the Sixth Five-year Plan,, the country should have 500 kilometers of first class roads; by the end of the Seventh 5-year Plan, it should have 2,000 kilometers, with another 2,500 kilometers being constructed over a period of time as local conditions require. Some areas can build roads in sections, while other areas can take over land at a single time to build two way roads for the sole use of motor vehicles after which they can build additional roads as transportation volume increases.

There should be 40,000 kilometers of second class roads. By the end of the Sixth Five-year Plan, there should be 20,000 kilometers of second class or better roads. Analysis shows that where the volume of mixed kinds of traffic reaches 3,500 vehicles per day, the road should be improved to second class standards (this is a minimum standard). We believe that this can be entirely attainable with effort.

There should be 180,000 kilometers of third class roads (including some high traffic county and township roads). Road sections on which traffic volume reaches 1,000 vehicles per day and night should generally be improved to third class road standards.



Efforts should be made to put a high quality or second quality surface on 300,000 kilometers of roads, depending on availability of materials. Where traffic volume per day and night reached 500 vehicles, by the end of the Seventh 5-year Plan between 350,000 and 400,000 kilometers should be roads with an oil residue topping. Since both funds and materials will likely be insufficient, some macadam roads carrying 500 vehicles per day and night will not be improved.

There should be 700,000 kilometers of county and township roads. On road sections where traffic volume reaches 1,000 vehicles per day and night, every effort should be made to build third class roads. Where conditions permit, additional third class roads should be built.

Twenty-eight new free-standing large bridges totaling 37,000 linear meters should be built (including rebuilding of some dangerous bridges).

If this goal is achieved, by the end of the Seventh 5-year Plan 80 percent of all roads will be able to carry a substantial volume of traffic, and average speed on trunk highways will reach 41 kilometers per hour. Transportation costs will be lowered by approximately 12.5 percent (not counting vehicle replacement or structural changes). Figured in 1990 terms, the newly added 100,000 kilometers of roads surfaced with oil residue should save 500,000 tons of gasoline (or diesel fuel) that year. Ninety-five percent of China's townships and more than 85 percent of its villages will be served by roads.

The following several ideas are suggested for gathering road construction funds to hasten road construction:

1. Appropriate increase in the collection of fees for road maintenance and expansion of the scope of collection.

To insure a steady source of income for road construction over a long period of time, in addition to the collection of road maintenance funds should be the collection of a vehicle purchase surcharge on all purchases of motor vehicles by units or individuals including national organizations and the armed forces.

3. State investment in road construction should, at minimum, be at the same level as the energy transportation fees that the state collects from road maintenance fees.

4. A system of "civilian operation with public support and construction by civilian labor" should be instituted under leadership of government organizations at all levels, the state providing subsidies, local jurisdictions gathering together funds, and the masses performing labor. Local amassing of funds is to include local jurisdictions help in taking over land, razing and moving of structure, payments for labor, and payments of funds from local treasuries.

5. Emphasis should be placed on preparatory work for projects, active efforts made to incorporate projects into state intermediate term and longterm plans and annual plans, with interest-free and uncompensated loans being made.

6. Collection of fees for newly built large bridges, expressway motor roads and tunnels.

7. Reform of the system to allow for placement of tenders, contracting and use of new techniques; measures for bolstering project construction and management of construction, and lowering of project costs.

If it is possible for the state to find the funds somewhere, it is hoped that more roads can be improved and upgraded so that road conditions will change markedly during the Seventh 5-Year Plan.

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## CHINESE MEDIA ON FOREIGN ECONOMIC AFFAIRS

### ON SUCCESSFUL ECONOMIC DEVELOPMENT IN HONG KONG, ELSEWHERE

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[Article based on lecture by Chen Kunyao [7115 0981 5069], director of the Asian Studies Center of Hong Kong University: "Experiences of the 'Four Small Dragons' in Economic Development and Problems in Special Zones"]

[Text] The economies of Hong Kong, South Korea, Taiwan and Singapore have developed very fast during the past 20 years. Because they have many similarities and have had a similar pattern of development, they have been termed the "four small dragons." China with its large land area cannot emulate the "four small dragons;" however, if China is discussed in terms of very many regions such as economic zones, then it is similar in many ways to the "four small dragons." Both Zhuhai and Xiamen resemble Hong Kong and Singapore, and one can examine experiences in their development. Therefore, to look at China in terms of the countries and regions that make up the "four small dragons" still has certain advantages.

#### 1. Four Stages of Industrialization

When talking about modernization, we frequently consider industrial development to be modernization. Good performance in industry entails going through many different stages, which may be divided into the first phase of import replacement, the second phase of import replacement, the first phase of export guidance and the second phase of export guidance. In making these distinctions, we do not mean to say that economic development in every country has to go through these stages; yet, one can look at a place's industrialization in terms of different stages. The traditional explanation has been that in the process of developing industry, there has to be import replacement. During the first phase of import replacement, labor intensive industries develop. Imports consist of labor intensive ordinary industrial goods such as raw materials and machinery. During the second phase, it is also unnecessary to import the means of production; one also has to produce them oneself. Comparatively speaking, a country does not necessarily benefit more from producing the means of production or machinery; therefore, it becomes increasingly difficult to carry out the second phase of import replacement. No matter how much a country lags behind in natural resources, it can still benefit in some ways more than others at any given time. This is the traditional method of industrialization.

Later on, however, there is yet another industrialization possibility, namely export guidance, by which is meant production of some simple, labor intensive industries, exporting to foreign countries, earning foreign exchange in return, and using the foreign exchange to buy other things. Since the question of comparative interest initially is still the operation of some labor intensive industries, this is the first stage of export guidance. Later on when your foundation has become firm, you can engage in some technologically intensive industries. This is the second phase of export guidance.

Hong Kong is a tiny place completely lacking in conditions for import replacement. Import replacement requires a very large internal market. During the initial phase of industrialization, Hong Kong's population was about 2 million--a very small market--so Hong Kong could not engage in import replacement. Hong Kong began with the third stage (the first phase of export guidance). Singapore differs from Hong Kong in many ways. For a time, Singapore practiced import replacement. Of course, Singapore has an even smaller population than Hong Kong, so it planned on uniting with Malaysia to form a federation, but that did not work out subsequently, so it separated from Malaysia. So it is still like Hong Kong in that it began with the first phase of export guidance. South Korea and Taiwan are somewhat different cases. They are a little larger, so they can engage in import replacement. Taiwan began industrialization in the 1950's, and South Korea began industrialization during the early 1960's. They both began with the first phase of import replacement. If you are going to replace imports, you have to use very many government policies, because during the first phase of industrial development you cannot compete with goods imported from outside. One simple method is to collect high customs duties to jack up the price of imports, carry out protectionism, and protect one's own industry. This is a policy for import replacement; there is no other way. Protection now raises costs of one's own products and temporarily sacrifices the interests of consumers. But viewed in long-range terms, protection of one's own industry also has definite advantages. Consequently, during the 1950's and 1960's, South Korea and Taiwan engaged in this kind of protection. They made very simple industrial manufactures and imported machinery and the means of production. By the late 1950's, Taiwan's production of labor intensive products had stagnated; they had to change their policies. Traditionally speaking, the late stage of the first phase is the time for the second phase of import replacement. Taiwan did this, but circumstances were not good. This was because the most beneficial thing for Taiwan at the time was not the production of means of production, heavy industry, and technologically intensive industries. Taiwan's greatest interest did not lie in these areas. Therefore, Taiwan engaged in a very short second phase of import replacement and then abandoned it. This was the reason for Taiwan's later success. This was also the case for South Korea, which went through the first phase of import replacement during the early 1960's and protected its own industry. During the mid-1960's, it found it very difficult to practice the second phase of import replacement, since South Korea's relative interest did not lie in heavy industry or in production of the means of production. As a result, South Korea also leaped into the third phase very quickly. During the mid-1960's, all of the "four small dragons" were in the third stage of development, namely the first phase of export guidance. During the mid-1960's, all of the small

dragons developed. Why couldn't other places succeed? India, with a large area and a huge population, a very long history and quite a few natural resources did not develop. Why? It was because it engaged in the first phase of import replacement for a very long time, and then engaged in the second phase of import replacement afterward. India encountered very great difficulties. It did not have the skills and other requirements in being to do the job, but it still built its own heavy industry and technologically intensive industries; however, it did not succeed. Nevertheless, the Indians had very strong confidence and persevered right up until the present time, but they have still not succeeded. They are stuck in this period and cannot get out. India is a very good example that provides experience in failure. Nor will India open itself up. Up until the time of the "gang of four," China would not open up either. It protected its own markets and used maximum protectionism to protect its own economy believing that it was not succeeding because of such a large population. At the beginning of the 1970's, India saw how the "four small dragons" had succeeded and wanted to emulate the export guidance. But it was too late because all the markets had been taken over by the "four small dragons." So India is still at this stage. Very many countries are like India. They are unable to free themselves from the second stage of industrialization. They simply do not understand the importance of export guidance, supposing that since their own markets are very large they do not need to export.

We can arrive at some conclusions as a result of experiences in the world's economic development and the success of the "four small dragons." An industrialization policy is a policy of export guidance. Simply stated, export guidance means opening up to the outside world. Thus I believe that although there may be very many policies that China may discuss and revise during the next several years, in terms of overall direction, China is on the right path. World experience in economic development shows it is necessary to open up to the outside world.

Why are export guidance policies good policies? Because the practice of protectionism is bad for the distribution of natural resources and economic efficiency is very low. Distribution of resources is the highest goal in the study of economics. Economics means thinking of ways to distribute resources most efficiently. If you practice protectionism, that will make efficiency very low in the distribution of resources. During the initial export period, competitiveness will be very low. If you force goods into international markets, frequently some subsidization will have to be done. From the standpoint of economics, subsidies to help exports are a little better than protection to raise the price of one's own goods. If you want to break into the international market, you have to find some relative interest that is nearest to you. Every place has its own relative interest; even backward countries also have their own relative interests. If you engage in import replacement, there will be many chances to assess matters incorrectly, for doing things wrong without realizing it, and for continuing on in the wrong direction. But when you engage in export guidance, if your relative interests are wrong, you will be unable to break open external markets and you will have to revise them. Hence, when engaging in export, possibilities of making mistakes are few in the distribution of natural resources and in finding one's own relative interests.



There is another very important theory. In the realm of accumulations, western economists maintain that sole reliance on internal capital for a country's economic development is not enough. For a country to save up a lot of money is also of no use. Economic development requires use of two kinds of capital, namely both internal and external capital. The reason is very simple: not all countries have all kinds of resources. You, yourself, may have a vast amount of money, but there are still many things you cannot buy. You must have capital from outside in order to be able to buy things from outside. The money is divided into two kinds: internal money and external money for different uses. This is because an economy's development still has to depend on external resources. Quite often, because your country is a backward one, your own money cannot be used to buy things from abroad. China is an example. There are very many backward countries whose money cannot be used to buy resources from abroad. It is thus necessary to rely on one's own savings on the one hand and to find foreign resources as well. How does one obtain foreign resources? There are two ways. One is to import foreign capital; the other is to export. If you want to earn foreign exchange, the most active way is through exports. Importation of foreign capital is passive. If the funds do not come, there is nothing you can do. Why is export guidance a better policy for economic development? After you have imported capital, you can raise productivity and step up your own economic development. When foreign capital and foreign exchange increase and when more machinery and technology are introduced, productivity can be raised and the economy grows rapidly. So, the economic theory that economic development has to depend on two kinds of capital is definitely reasonable. Therefore, opening to the outside world is an important reason for economic development. Western economists discussed this problem long ago. But to know this principle is not enough. How does one put export guidance into practice? Not every country's economic development can opt for economic development at the very outset, because you still do not have an economic foundation. Neither Taiwan nor South Korea went in for export guidance at the outset, but went through a period of import replacement. The first phase of import replacement was the foundation. Without this foundation, how can your exports compete with those from foreign countries? Hong Kong and Singapore had no import replacement at all. They used export guidance from the very beginning. But, we should not forget that both Hong Kong and Singapore also had a foundation preparation period. Even before they industrialized, they engaged in entrepot trade, and the entrepot trade requires enormous capital construction, plus extensive trade experience and contacts. So they could opt for export guidance from the very outset.

## 2. Role of Various Production Factors During the Export Guidance Stage

How were the "four small dragons," particularly Hong Kong, able to do a good job of export guidance? If every country did a good job of export guidance and was successful, there would be no poor countries. But matters are not this simple. Export guidance is only a direction. Once one has a direction, one has to have other conditions as well that can be developed. We can look at the success of the "four small dragons" in terms of economics, politics and culture. In the economic realm, if you want to go in for economic development, and if you want to achieve strong competitiveness, both from the standpoint of western economics and from the standpoint of Marxist economic thinking, production factors are naturally very important. Western economists say that

there are four production factors. The first is labor; the second is capital; the third is entrepreneurial spirit; and the fourth is land. Every kind of production needs these four things. If you want to engage in export guidance, during the first phase of export guidance of labor intensive industry, it is fine if wages are not necessarily low. The amount of wages has to be discussed together with productivity. If your wages are low and productivity is lower, that would be completely useless. So wages have to be at a reasonable level, and at a level that is very highly competitive. Achieving this means, first, that there can be no monopoly on the labor market. In foreign countries, trade unions are frequently too strong, as in the United Kingdom where trade unions have enormous power. They can strike at any minute. So monopoly is trade union monopoly. If trade unions have a monopoly on labor, wage levels cannot be reasonable, and competitiveness cannot be very great. In addition to this, worker productivity is also very important. Labor productivity is related to workers' cultural levels, how diligent they are, and how much education and training they have had. In Hong Kong, trade unions do not work for the workers' welfare; they wrangle about political issues. So no monopoly of the labor market has taken place. In Singapore, South Korea and Taiwan, the governments have immense power. They suppress trade unions and trade unions can do nothing about it. The "four small dragons" have no trade unions to monopolize the labor market, so wage levels are at a competitive level. Yet another element affecting workers' wages is how mobile labor is. If workers are not highly mobile, capitalists can control them because you cannot get away. Workers with strong mobility are better off.

As far as education is concerned, one feature of the "four small dragons" is that the educational level of the average worker is higher than in very many third world countries. I think this has something to do with Chinese culture. They have been influenced by Confucian thinking. Confucian thinking sets great store by education. Some people believe that this has had a bearing on the economic development and the fairly complete legal systems of the "four small dragons." But the facts are otherwise. The laws in developing countries often are intended to help the workers; however, unless the whole economy develops, very many workers will have no work to do and the workers themselves are the one's who suffer. Consequently, they hurt the workers. The "four small dragons" do not have this problem, but I'm afraid Taiwan has it a little. Capital is important, of course and when savings are insufficient, it is necessary to use foreign capital. The "four small dragons" use foreign capital, and they are able to use foreign capital very well. Using foreign capital very well means that domestic enterprises and foreign transnational companies work together to bring benefits from outside into domestic enterprises. If China were to import capital with foreign enterprises doing their thing and Chinese enterprises doing their thing, that would be of no use.

Entrepreneurial spirit is important, and a spirit of adaptation among entrepreneurs is even more important. In Hong Kong, entrepreneurs from Shanghai take the lead. This is related to culture. It is Confucian culture; it is a traditional way of thinking. Under traditional thinking, Chinese workers want to become the boss all of a sudden. This is very natural. The west is different. They only want to have automobiles and houses and that's

all. Hong Kong, Taiwan and South Korea are like this, but Singapore is not. Medium and small enterprises play a very good role, particularly during the first phase of export guidance.

If one asks a Singaporean what he would like to do in the future, his answer is to be on the staff of a transnational company. In Hong Kong, the answer is different. He wants to become the boss. The difference in thinking is because Singapore has not diffused the entrepreneurial spirit. Singapore was an entrepot for a long time engaging mostly in business and without an industrial entrepreneurial spirit. Prospects were not favorable. One should not emulate the Singapore example. If suddenly there is a crisis and foreign capital flees, it will be hopeless. Forty-five percent of Singapore's exports of industrial manufactures today come from transnational companies. If the transnational companies fail, it will have only 25 percent of exports left. Only 16 percent of Hong Kong's exports of industrial manufactures are from transnational companies. Hong Kong's economy belongs to Hong Kong, while Singapore's economy belongs to the transnational companies.

In South Korea, numerous entrepreneurs are not from South Korea. Korea's center is in the north, not in the south. It was only because of the split that they fled from the north to the south, and this is the source of South Korea's entrepreneurs. Taiwan had no industry. When the Japanese were in Taiwan they only went in for some agriculture. Once mainland entrepreneurs fled to Taiwan, Taiwan's entrepreneurs also fanned out.

Hong Kong's land policy has been severely criticized. Government intervention in land has been formidable, but it has had its good and its bad aspects. The good aspect has been development of many new market towns; the bad aspect has been government monopolization of land; it is a government preserve. Some people criticize the government for only selling the land and sending the money back to the United Kingdom, but this is unfair. The British are a little bit "clever;" the Hong Kong government puts its money in United Kingdom banks which pay interest that is lower than the world market rate. Aviation rights are also assigned to British aviation companies. Hong Kong has an inadequate supply of land, which is not good for development of the economy.

During the first phase of export guidance, an inadequate supply of land is not a large problem, but if one wants to develop heavy industry an inadequate supply of land is a big problem. Hong Kong's inadequate supply of land and lack of a long-term plan prevents development of Hong Kong's economy. Hong Kong land prices are very high. During the initial export period when export is a labor intensive enterprise carried on mostly by medium and small enterprises, insufficient land remains a not very large problem. Numerous small plants are mixed in with civilian houses. If heavy industry or knowledge-intensive industries are developed, insufficient land becomes a big problem.

In the final analysis, economic factors are dependent on market function, that is to say the role of the market is paramount and the role of government is ancillary. Do not suppose that the Hong Kong government does not intervene in the economy. That is inaccurate. Hong Kong's intervention is least. In Taiwan, South Korea and Singapore, there is much intervention. Not only is there intervention, but their governments also control large amounts of

industry and commerce, approximately 30 percent of them. To control these enterprises, the governments use very many methods. Do not suppose that all the enterprises in the "four small dragons" of Asia are private enterprises; many are owned by the state.

In addition to the four factors of labor, capital, entrepreneurial spirit and land, there is yet another factor, namely technology. The more freedom the better for labor, capital, entrepreneurial spirit and land; the market can play its role to the full. But with the element of technology, without government intervention technology would surely not develop. There is no experience and no foundation. Without government intervention and subsidies, production technology could not improve. This is because the development of technology is a very big problem. Individual interests and society's interest are very different. In the United States, for many industrial inventions and technical inventions the individual person remuneration rate is 25 percent but the social remuneration rate is 56 percent. This is a very serious problem. The Hong Kong government's non-intervention in technology is a mistake. During the initial phase of exports when products are labor intensive and technical requirements are not high, it doesn't matter much if government does not help individuals pursue technology. But this will not do for continued development. Both the South Korean and Singapore governments took action early to help development of technology. They realized that remuneration to individuals and to society were different. The biggest problem with the Hong Kong government is that it did not see the technology issue accurately. A free market cannot play the maximum role in every field; the market is not omnipotent. The market can solve a lot of problems and it distributes capital very well. Sometimes when social and individual remuneration differ, the government should certainly interfere. Hong Kong has been lucky. It has exported labor intensive products for the past 20 years for which technical factors have not been important, so no problems arose.

Hong Kong has successful experiences, but what problems exist? In going from the first phase of exports to the second phase of exports, in comparison with the other three "small dragons," there are many problems with its products. The crux is that a good job has not been done in technology. Development of technology cannot rely solely on private enterprise.

Economic and cultural development are closely related. During the past several years, anthropologists have been discussing the issue of the "four small dragons," and thinking back and forth that economic success contains non-economic elements. The "four small dragons" and Japan are connected to the Chinese cultural tradition, i.e., they are related to Confucius. No place in the world has had a 10 percent speed of growth except the places that eat with chopsticks. Consequently, "chopstick culture," and "chopstick economics" doctrines can maintain a 10 percent speed of economic growth. During the past 2 years, China has also had this speed of growth.

This "chopstick culture" is related to Confucius, namely in education, in the patriarchal system, social class concepts, and nationalist economies. These things are antithetical to modernization; however they are advantageous during the first export phase. They can stabilize society, which is a prerequisite for economic development.



According to Confucian culture, men of talent become officials. This is a very good thing because it can increase government efficiency and this is advantageous for development of the economy. This is very marked in Japan. Things are not this way in the United Kingdom and the United States. In the United States the best people become lawyers and make a lot of money.

Certainly Confucian culture also has disadvantageous elements such as the disdain of profit by men of noble character and the relegation of business to a very low status. These disadvantageous elements have become advantageous elements in the "four small dragons." Why? The governments of the "four small dragons" are very authoritarian and practice dictatorship. Talented people cannot engage in government and agriculture is not important in these places, so they go into industry and commerce.

This is a linking of cultural origins and the economy. This relationship, particularly Confucian thinking, can have a bad aspect during the second phase of exports. Family enterprises are disadvantageous for the running of large scale enterprises.

Possibly the reasons for success may be different in the first phase and the second phase of imports.

The political system is closely related to economic development. If you want to develop an economy, you have to have a strong government and an authoritarian government that has a high degree of economic development as its goal. This was the case during the first export phase for Japan and the "four small dragons." Both South Korea and Singapore had numerous financial groups that cooperated closely with the government and played a beneficial role in the economy.

A strong and highly efficient government plays a major role in the economy. The success of the "four small dragons" is attributable to having a combination of government, culture and economics. This was the model for development of the "four small dragons."

In sum, to export requires having highly efficient workers, flexible entrepreneurs, highly efficient administration and management and high accumulations. These are the prime conditions for engaging in exports.

The competitiveness of every country lies in competition in wages and technology, and technology has to be out in front. The "four small dragons" had no "edge" in technology; it was very difficult for them to develop and other countries pursued very rapidly. Malaysia, India and Thailand pursued them very hard. Because wages are very low in these countries, the "four small dragons" could be overtaken by other countries very early. During the early 1970's South Korea built shipbuilding, electrical machinery and chemical industries; however, luck was against them. These are all labor intensive industries and it was at this time that the petroleum crisis occurred. During the mid-1970's it was Taiwan, during the late 1970's it was Singapore, and today it is Hong Kong that is preparing to go into these industries.



Some people say that if the "four small dragons" take over the markets, what will China export? I don't think this will necessarily be a problem. Right now the "four small dragons" are entering the second phase of export guidance, and this will give China an opening. There is the "wild goose theory" that at various stages the economies of individual countries take off like row after row of geese. Japan took the lead; wages increased rapidly in the "four small dragons," and China's "luck" should be better than India's. During the early 1970's South America also started up in places like Brazil and Mexico, but they were too impatient. They ran when the "four small dragons" had not yet run. China should not be impatient in developing exports. It should do a good job on the first phase of export guidance and then go on to the second phase. In studying development of China's economy, one should look at the history of development of the whole world's economy. This is of definite reference value.

One of the problems in going from the first phase to the second phase in export guidance is markets and the second problem is technology. Why are markets important? In order for products to break into markets, one's own goods have to be tested in the markets and then take over the markets. This is what Japan did. The markets of the "four small dragons" are small, for them it is not a problem to open up world markets suddenly. After several years of effort, South Korea exported automobiles to Canada and the United States to enter world markets. According to the "wild goose theory," Japan will race ahead or there will be an opening for it to turn. South Korea did a good job of shipbuilding. Japan built big ones and high ones, and South Korea built small ones and low ones. Hong Kong's biggest problem is not giving serious attention to the development of technology. If the Hong Kong government would change its policies a little bit, in view of the large market with which it has close relations in China, its prospects would be better than for any of the "small dragons." The Hong Kong government holds the views that the reason things went so well in the past was that the government refrained entirely from interference and refrained entirely from having anything to do with developing technology. In fact, they do not understand that technological development has different stages, and requirements during the first and second phases of export guidance differ requiring different policies. The Hong Kong government has not understood this point right up to the present time. Hong Kong has been too greatly influenced by colonial policies. It is now entering a transitional stage and future policies will be a little more open and Hong Kong will have prospects. Otherwise the change from the first to the second phase of export guidance will be even more difficult.

### 3. Evaluation of the Special Economic Zones

A friend asked me whether my criticisms of the special economic zones was not excessive. In the past, criticism of the special economic zones was done from static discussion of the special economic zones, and they should be looked at dynamically. The economic development of the "four small dragons" just discussed had a preparatory period; they did not suddenly becoming exporting places. The preparatory period may be a period of entrepot trade. The economic zones have done not done a bad job of trade, but they have bought some things cheaply and sold them at a high price; tax collection has not risen; and much money has been earned. This is not good. This is a management problem. The special economic zones have a tax collection problem. The

economic zones are entrepot places; they are a very good experience for international trade. So the special economic zones use tax reduction or exemption from taxes, taxes being collected when goods leave the special zones. What is wrong with this? Hong Kong and Singapore do the same thing, so when Shenzhen does it, what is wrong with that? International trade experience is not something that can be learned in an instant; but it can be learned through entrepot trade. What is bad now is that the special zones use reduction or exemption from taxes to sell things inside China. If some things are used in the special zones, tax collection may be reduced or waived; when they are taken into inland China, the same price is collected as for other things. This is all right. The criticism is that only 3 to 5 years have passed, so isn't it a little early to criticize; no problems are apparent after several years' time.

As for the "blood transfusion theory," current figures show 7 percent as being given by the central government and most of the rest coming from bank loans. The central government has a responsibility for giving money to the special zones. Not only does this benefit the special zones, but it is in the interest of all Chinese. This is the economic theory of "extraterritorial benefit." If money is borrowed and repaid, what is wrong with that? Many of the people who criticize the special economic zones are not economists, and they do not understand economic theory.

Why should an enterprise make inventions? Making inventions benefits everybody. This is an "extraterritorial benefit," but it is not to say that the central government provides full support to the economic zones; use of some money to support the special economic zones is correct. Furthermore, borrowing of funds from banks to develop economic zone capital construction is also correct. Without money, how could they be developed? Foreign funds are fine, but if they are not forthcoming, you still have to do capital construction. The pay back period for capital construction is usually around 10 years. But only 3 to 5 years have passed, and you are saying it is no good. What is to be done? Borrowing money and repaying money to do business is the best. The question is whether one understands how to use the borrowed funds. Hainan Island borrowed money to buy automobiles; this was wrong. Shenzhen borrows money for capital construction to bring in foreign capital. It can pay it back in 5, 10 or 20 years, so what is wrong with that? We have to look at it this way. Take Brazil and South Korea as examples. Brazil borrowed an enormous amount of money and owed huge debts but it did not have the ability to repay the money. South Korea also borrowed and had huge debts. In world terms, South Korea has a very high debt ratio, but it has the ability to repay the money, so why shouldn't it borrow? When people in Hong Kong talk about the special economic zones, first they don't understand economics and second they just talk, focusing their attention on non-economic matters. Actually this is an issue that should be discussed only by economists, but those who criticize today are not economists. Economists are relatively sympathetic, and I am relatively sympathetic with the special economic zones. Nevertheless, this is not to say there are no problems. The problems are problems of special economic zone policies. The money spent has not all been on export guidance; spending money on talented people is correct. Shenzhen has operated a lot of training classes and has trained too many people for management. This is not to say that management is not important; however, the important thing is the

training of workers. Few workers have had sufficient training and they have had insufficient general education. Not enough money has been spent on this, and not enough attention has been devoted to medium and small enterprises.

If most of the investment in special economic zones has been on theaters, libraries and museums, that is wrong. These are showpieces. Money has been spent wrongly, but they believe that foreigners will go there only if there are such things. Not necessarily. This is a mistaken idea. I am not saying that everything in the special economic zones is all right, but I am saying that in criticizing the special economic zones, people have not criticized the things that should be criticized, and they have criticized things that should not be criticized.

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